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MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

JULY, 1872.



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# MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,  
*Statistical Division, July 20, 1872.*

SIR: I present herewith, for publication, a report of the condition of the crops in the first week in July; consular and other communications concerning the rural affairs of foreign lands, and the results of experiments and investigation in the several divisions of the Department during the past month; with market reports, and various facts from original sources.

J. R. DODGE,  
*Statistician.*

Hon. FREDERICK WATTS,  
*Commissioner.*

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## CONDITION OF CROPS IN JULY.

A misapprehension appears to exist in many minds as to the time of making and sending crop reports. Many appear to understand, for example, that the July report is made up from local reports received during the month of June. On the contrary, the observations taken on the 1st of July by the regular correspondent, aided by a board of assistants, are put in writing and forwarded to this office, from interior counties in Oregon, or in Texas, or Minnesota, as well as from nearer post-offices, and, as fast as received, their information is tabulated and condensed, averages made and corrected, the tables and digest analyzed, and calculations made, and a summary published between the 15th and 20th of each month, although the reports are never all in on the 15th. Still, there are some persons whose activity outruns their reason, who imagine that a census can be taken and tabulated *weekly*, though mail service to complete it requires two weeks, from points at which telegraphic communication is impossible.

### CORN.

*Area.*—The lateness of the spring and unfavorable weather during the planting season in many sections has prevented any marked enlargement of the area in corn. The tendency is toward an increase in the South, and in the States in which wheat has been predominant. From 989 counties, including an area usually producing 600,000,000 to 700,000,000 of bushels annually, come returns indicating an increase of 3 per cent. This is equivalent to more than three-fourths of a million acres; and the total area in this great crop of the country, which nearly equals in extent the aggregate of all other tilled crops together, is prob-

ably about 35,000,000 acres. The States in which an increase of acreage is reported are as follows: New Jersey, 2 per cent.; Pennsylvania, 2; South Carolina, 2; Georgia, 1; Alabama, 3; Mississippi, 1; Louisiana, 8; Texas, 8; Arkansas, 4; West Virginia, 2; Kentucky, 2; Ohio, 2; Michigan, 10; Indiana, 1; Illinois, 2; Iowa, 1; Missouri, 4; Kansas, 28; Nebraska, 20; California, 1. A diminution appears in Maine of 4 per cent.; Vermont, 2; Massachusetts, 4; Rhode Island, 5; Connecticut, 6; New York, 1; North Carolina, 2; Tennessee, 1; Wisconsin, 4; Minnesota, 3. The area in the remaining States is reported the same as last year.

*Condition.*—The meteorological peculiarities of the season have received much comment in the returns. The rain-fall is sometimes ten-fold greater at one station in a State, during a given month, than at another in the same State. A medium amount of rain, falling moderately in small quantities, at frequent intervals, has a more favorable effect upon the growing crops than a much larger quantity at long and irregular seasons in violent storms. In the Ohio Valley, as in Ohio and Indiana, complaints of long and almost unbroken droughts are received from many counties in different parts of those States, affecting wells and streams, and greatly retarding vegetable growth; while in many other counties seasonable and frequent rains are reported, and in some cases abundant supplies of moisture. In some cases wet districts are in close proximity to dry areas; and both wet and dry localities are sometimes found in the same county. In different sections of the country, in which seasons of drought have occurred, sudden and violent storms have deluged low-lying lands, carried away bridges, and damaged crops. These peculiarities are noticeable during each recurring summer, but the variations in amount of rain-fall, and in the frequency and force of storms, seem greater than usual the present summer. These facts of meteorology, little understood by the wisest, demanding investigation and patient study, have a bearing upon vegetable growth which will some day become obvious, to the increase of farm production and the profit of the farmer. The minimum and maximum rain-fall of the great corn-growing States for the month of June, so far as reported by the meteorological observers of the Smithsonian Institution, are as follows:

	Minimum. Inches.	Maximum. Inches.
Kentucky.....	3.38	4.82
Ohio.....	1.96	7.25
Michigan.....	2.42	4.35
Indiana.....	1.40	6.67
Illinois.....	3.10	9.95
Iowa.....	1.53	7.90
Missouri.....	1.45	3.35
Kansas.....	1.75	4.00

But for the unpropitious meteorological conditions referred to above, the season would have been quite favorable, having an unusual measure of sunshine, and a degree of heat well suited to the growth of corn. The returns from 263 counties place condition above 100; 313 counties report 100; and 413 below average, Illinois is represented by 65 counties, of which 22 stand above average and 23 below; of 64 counties in Missouri, condition of corn is above average in 16, and below in 25; of 36 in Kansas, 8 only send figures less than 100. In Iowa, where cool, cloudy weather generally prevailed in spring, followed by changeable weather, and in some sections heavy rains, only 2 reports of condition are above 100; and in Ohio, where the drought has been severe, but

3 reports of 45 give figures higher than 100. The States making returns higher than 100 are: Vermont, 101; North Carolina, 101; Alabama, 110; Mississippi, 110; Louisiana, 119; Texas, 110; Kentucky, 103; California, 101. The following return condition below average: Maine, 96; New Hampshire, 98; Massachusetts, 98; Rhode Island, 92; Connecticut, 98; New York, 95; New Jersey, 96; Pennsylvania, 98; Delaware, 92; Maryland, 92; Virginia, 94; South Carolina, 96; Georgia, 94; Florida, 78; Arkansas, 95; West Virginia, 95; Ohio, 90; Michigan, 96; Indiana, 95; Illinois, 99; Wisconsin, 86; Minnesota, 86; Iowa, 88; Missouri, 97; Kansas, 98; Nebraska, 97; Oregon, 97. Tennessee is placed at 100. The following classified statement presents the number of counties reported in each State:

States.	Above average.	Average.	Below average.	States.	Above average.	Average.	Below average.
Maine .....	2	2	6	Texas .....	28	7	6
New Hampshire .....	2	2	3	Arkansas .....	3	6	7
Vermont .....	3	3	3	Tennessee .....	21	13	9
Massachusetts .....	1	5	3	West Virginia .....	5	6	17
Rhode Island .....	1	1	2	Kentucky .....	17	12	15
Connecticut .....	1	3	3	Ohio .....	3	13	29
New York .....	5	7	19	Michigan .....	7	11	12
New Jersey .....	2	4	4	Indiana .....	9	13	28
Pennsylvania .....	8	21	11	Illinois .....	22	20	23
Delaware .....	2	1	2	Wisconsin .....	2	4	19
Maryland .....	2	2	5	Minnesota .....	2	2	19
Virginia .....	6	12	29	Iowa .....	2	12	43
North Carolina .....	19	21	10	Missouri .....	16	23	25
South Carolina .....	3	5	8	Kansas .....	8	20	8
Georgia .....	14	21	25	Nebraska .....	2	5	4
Florida .....	1	2	11	California .....	3	9	1
Alabama .....	14	8	5	Oregon .....	.....	6	4
Mississippi .....	19	6	.....				
Louisiana .....	11	5	3	Total .....	263	313	413

Total number of counties, 989.

### The following extracts from correspondence are appended:

MAINE.—*Franklin*: Injured by excess of rain. *Piscataquis*: Protracted wet season narrowed the area of corn. *York*: Ground rather wet for corn.

NEW HAMPSHIRE.—*Rockingham*: Delayed ten days by the wet and backward season. *Hillsborough*: Coming forward rapidly; prospect good for a fair crop.

VERMONT.—*Franklin*: About average. *Orleans*: Very backward up to June 15; late warm showery weather has greatly improved the crop.

MASSACHUSETTS.—*Hampshire*: Crops suffered from cut-worms.

RHODE ISLAND.—*Washington*: Injuries by white worms, especially on old meadowland, but confined to land broken this season; crop probably 20 per cent. below average.

NEW YORK.—*Yates*: Looks well, and if frost does not come too soon will be a heavy crop. *Jefferson*: Injured by cut-worms. *Sullivan*: Doing well; weather warmer. *Wyoming*: Small, but stands well. *Genesee*: Late, but stands good and growing finely. *Cattaraugus*: Growing fast. *Otsego*: Backward. *Erie*: Late and small, but of good color. *Ontario*: Growing rapidly.

NEW JERSEY.—*Mercer*: Retarded by late spring. *Morris*: Backward but growing fast.

PENNSYLVANIA.—*Westmoreland*: Improved by recent rains. *Cumberland*: Early corn shortened by drought and cut-worms. *Lancaster*: A little backward. *Berks*: Average. *Bradford*: A little late, but looks well. *Fayette*: Short, but growing finely. *McKean*: Injured by wire and cut-worms. *Indiana*: Promises an average crop. *Centre*: Promises an abundant yield. *Northumberland*: Promising. *Lehigh*: Backward. *Armstrong*: Large crop planted in good condition; suffered from cut-worm, yet growing finely. *Lycoming*: First planting damaged by worms, but has been generally



replanted and is now doing well. *Butler*: Injured by cut-worms; many fields replanted, hence backward. *Montgomery*: Encouraging condition.

DELAWARE.—*Sussex*: Looks very promising.

MARYLAND.—*Baltimore*: Average large; stand good. *Frederick*: Another month's drought will kill the crop. *Montgomery*: Great difficulty in getting a stand where the ground was not plowed in the fall; cut-worm mischievous. *Washington*: Very promising; a favorable season will bring a large crop. *Cecil*: Planted late, and retarded in growth on account of drought. *Queen Anne*: Late rains have greatly improved the crop.

VIRGINIA.—*Albemarle*: Very short, but may come out with rain. *Clarke*: Backward but healthy; a large proportion replanted; cut-worm unusually destructive. *Mecklenburgh*: Very thrifty; greatly benefited by recent rains; much of it replanted. *Nelson*: Clean and healthy, but small. *Prince William*: Not flattering. *James City*: Well worked and in fine condition. *Cumberland*: Backward, and will suffer severely without speedy rain. *Henrico*: Small, but holds color, and with rain will yet make a crop. *Frederick*: Improving. *Prince Edward*: Small and backward, but with a good season will make a fair crop. *Surrey*: Small and backward, but late seasonable weather has greatly improved it. *Highland*: Injured by worms; some fields replanted three times; injured also by drought; late growing weather is rapidly improving the crop. *Orange*: Injured by worm and drought. *Powhatan*: Bad stand. *Fluvanna*: Shortened by drought. *King George*: Crop low, but may yet be good. *Culpeper*: Seriously injured by drought; many fields entirely replanted. *Spotsylvania*: Crop large and promising; worm destructive in good lands, causing some fields to be replanted. *New Kent*: Well worked and in good condition but backward; good rains will make a large crop. *Greenville*: Corn area decreasing to make way for cotton. *Stafford*: Improved by late rains. *Craig*: Crop injured by worms. *Augusta*: Drought and insects prevented an early stand; late rains have helped the crop greatly.

NORTH CAROLINA.—*Gaston*: Growth vigorous; above average. *Forsyth*: Crops promising. *Chowan*: Three weeks late, but looks well. *Alexander*: Yellow field-corn looks well so far. *Lenoir*: Injured by the heavy rains in June. *Bladen*: Crop late but good. *Greene*: Bad stand; at least 20 per cent. below the condition of this time last year. *McDowell*: Very much improved; prospects average. *Hertford*: Small, but doing well. *Beaufort*: June decidedly unfavorable to late planted. *Jones*: Dry hot weather injurious. *Person*: Very fine; pushed rapidly by recent rains and hot sun. *Alamance*: Promises well. *Rowan*: Condition excellent. *Rockingham*: Promising; six weeks more of good weather will make as good a crop as ever was made. *Craven*: Small, but promising a large crop. *Franklin*: Looks well. *Currituck*: Backward, but doing well; prospect of a fair yield. *Perquimans*: Looking well; prospect good. *Edgecombe*: Injured by neglect; all the attention paid to cotton.

SOUTH CAROLINA.—*York*: On valley and loam lands average; on clay lands, below. *Clarendon*: Injured by drought; stalks low; crop will probably be short. *Orangeburg*: Shortened by drought; clear of grass. *Marlborough*: Early planted doing very well; late planted will require a favorable season. *Newbury*: Owing to drought upland will not yield one-fourth of a crop; bottom and low island crops probably average. *Lexington*: Remarkably fine; yield probably 50 per cent. greater than last year. *Columbia*: Almost average. *Georgetown*: Late planted suffered from drought. *Chesfield*: Reduced by dry spring.

GEORGIA.—*Muscogee*: Looks well, except in localities where drought has prevailed. *Forsyth*: Looks well, though worms are injuring it in places. *Chattooga*: Seasonable rains have improved the crop. *Columbia*: Without speedy rain the crop must be very short. *Quitman*: Average increased 10 per cent.; plants small, but healthy and well cultivated. *Effingham*: Crop will be good if rain comes soon. *Pulaski*: Poor prospect. *Lee*: Late rains are repairing somewhat the injury of the previous drought. *Schley*: Shortened 20 per cent. by drought. *Wilkes*: Corn planting delayed; crop injured by drought. *Murray*: Late seasonable rains in favor of the crop. *Walton*: Yellow Pennsylvania corn matured early. *Marion*: Injured by drought. *Gwinnett*: More forward than for many years. *Butts*: Early corn suffering from drought. *Oglethorpe*: Has not realized its early promise; earliest varieties are doing best. *Whitefield*: Promising. *Cobb*: Very fine. *Clay*: Will be 25 per cent. short. *Macon*: Much of the corn a total failure. *Merrivether*: Unpromising.

FLORIDA.—*Columbia*: Injured by drought. *Hillsborough*: Short. *Manatee*: In the eastern part of the county killed by drought. *Jackson*: Half a crop. *Bradford*: Doing well. *Alachua*: Drought has reduced corn to a half crop. *Gadsden*: Short 25 per cent. *Clay*: Increased attention to corn. *Wakulla*: Injured by spring freshet and summer drought; late showers may bring it up to half a crop.

ALABAMA.—*Lowndes*: Condition better than last year. *Concuh*: Small, and not looking well. *Colbert*: Unusually promising. *Greene*: Crop will be good. *Pike*: Stalks short and color good, with fine shoots; weather very favorable. *Dallas*: Promising, but in danger of being slighted for cotton. *Butler*: Injured by drought. *Montgomery*: Average reduced 10 per cent.; aggregate yield will equal last year's. *Calhoun*:

Prospect full average. *Madison*: Best prospect in seven years. *Limestone*: Unusually well worked; in fine condition. *Clarke*: Suffered from drought and worms; but little left on stiff lands. *Autauga*: Backward and small, but looks well. *Lauderdale*: Fine condition; one good rain in July will finish the latest plantings. *Tuscaloosa*: Crop fine.

MISSISSIPPI.—*Wilkinson*: Better than for three years. *Wayne*: Indifferent stands. *Newton*: Very promising. *Grenada*: Crop promising where well cultivated; nearly matured in some sections. *Winston*: Crop better than for years; with seasonable weather the production of the county will be greater than its consumption; yellow Pennsylvania four or five weeks earlier than the native; possibly two crops of it might be made in the year. *Leflore*: Pennsylvania yellow planted March 15 yielded roasting-ears June 15; will mature three weeks earlier than native corn planted at the same time. *Madison*: Another good rain will make the largest crop since the war; late crops mostly failures from bad working. *Holmes*: Good prospect. *Tishomingo*: Crop prospects fine. *Noxubee*: Never more promising. *Neshoba*: Doing very well. *Yalobusha*: Promises to be 50 or 75 per cent. above last year.

LOUISIANA.—*Iberia*: Corn acreage 40 per cent. greater than ever before. *Red River*: On the bottoms finer than for years; not so good among the hills. *East Baton Rouge*: Very promising. *Richland*: Prospect better than for ten years. *Lafourche*: Acreage increased, and yield promises to be large enough to do away with the importation. *Morehouse*: Promises a very large crop. *Carroll*: Prospects very flattering. *Winn*: Fine promise. *Rapides*: A fair average; better than last year.

TEXAS.—*Fannin*: Promising; nearly safe. *Hardin*: Fine prospect. *Fort Bend*: 6,000 acres planted. *Liberty*: Crops 50 per cent. better than last year. *Red River*: Early corn mostly replanted; never looked finer. Pennsylvania yellow from the Department very fine. *Henderson*: Crop safe; better tillage than usual. *Ellis*: In full roasting-ear; crop fine. *Kendall*: Corn planted March 1 will average 40 bushels per acre. *Cherokee*: Late rain has placed the crop beyond danger. *Williamson*: Will average 45 bushels per acre. *Fayette*: Crop safe, and better than for years. *Milam*: Best crop for many years. *Rusk*: On high grounds corn needs rain, but looks well. *Harris*: An enormous yield expected. *Johnson*: Looks unusually well for the season. *Bezar*: Fine; hard enough to grind. *Colorado*: Best crops since 1869. *Upshur*: Crops very unequal. *Marion*: Crop 20 per cent. above the best past crop. Pennsylvania yellow in roasting ear; will yield 30 bushels per acre; Peabody 50, a week later. *Hamilton*: Crop clean and healthy, but low. *Medina*: Promises nearly an average crop. *Grimes*: Injured by hail. *Lampasas*: Promising. *Bell*: From 30 to 50 bushels per acre. *Matagorda*: Ruined by drought.

ARKANSAS.—*Craighead*: Crop retarded by rains. *Union*: Crop in the grass. *Sebastian*: Excessive June rains injurious.

TENNESSEE.—*Decatur*: Crops promising. *Hancock*: Looks fine; has been well cultivated. *Madison*: Drought did not affect, except to give a better chance to make it. *Wayne*: Remarkably fine. *Stewart*: Growing slowly; well cleaned. *Haywood*: Crops neglected. *Bradley*: Materially injured by drought. *Sevier*: Beginning to look fine. *Humphrey*: Average reduced 10 per cent. *Jefferson*: Rather above average. *Roane*: Fine condition. *Rutherford*: Backward, through neglect and cut-worms. *Hawkins*: Healthy and vigorous, though backward. *Davidson*: Late rains have made the crop luxuriant. *Sullivan*: Growing finely; promises a good crop; many fields several times replanted on account of cut-worms. *Macon*: Backward.

WEST VIRGINIA.—*Braxton*: The dry, cold spring put the crop back, and the worms destroyed some fields so that replanting was necessary, but it is now growing fast. *Upshur*: The cut-worm was so destructive that many fields were replanted the third time. Squirrels also took up considerable in fields bordering upon woodland. *Harrison*: Very backward, but doing well now. Early corn much damaged by cut-worm. *Cabell*: Condition good. *Fayette*: Doing very well now, but the weather was too cool for some time after planting, and afterwards too rainy for thorough culture. *Monongalia*: Very promising. *Monroe*: Much sod-land was broken up to increase the acreage, but the cut-worms were so numerous as to destroy the first planting, so that the crop is now backward.

KENTUCKY.—*Clarke*: Suffering from dry weather. *Hardin*: Looks well. *Fayette*: Promising. *Lincoln*: Backward, but of good color. *Pulaski*: Damaged somewhat by storms. *Hopkins*: Looking well. *Carroll*: One of the best seasons ever known. *Anderson*: Rather backward, but in good condition. *Edmonson*: Rather late, owing to cold, wet spring, but now growing finely. *Clinton*: Not large, but color good and growing well. *Ohio*: Season favorable. *Russell*: Owing to dry weather in May the corn looked unpromising until the recent favorable season.

OHIO.—*Franklin*: Needs rain badly; on thin clay lands the rows are hardly discernable yet. *Ottawa*: Suffering from drought. *Butler*: Condition good, although planted nearly two weeks later than usual. *Adams*: On ground plowed previous to the freshet of April 15, the corn looks finely, but where the ground was broken up after that date, the cut-worm has been so destructive that some farmers have replanted the third time.



*Scioto*: Stands generally good, and looks well. *Geauga*: Backward, owing to late planting and cool weather at first, but a favorable season will insure a fair crop. *Pickaway*: Injured by drought. *Auglaize*: Very late, owing to the cut-worm; many fields replanted three times. *Holmes*: Backward and small until a recent rain and warm spell, owing to dry, cool spring. *Morrow*: Much above average, except in localities where the cut-worms have destroyed it. Some fields have been replanted two or three times. *Delaware*: Promises finely. *Crawford*: Doing well. *Brown*: Backward, owing to the ravages of the cut-worm, causing several plantings. *Athens*: Much retarded by cut and grub worms, but very clean and of good color. *Wood*: Prospect unusually good.

**MICHIGAN.**—*Wayne*: Never looked better. *Livingston*: Needs rain. *Lenawee*: Promises a full crop. *Washtenaw*: Doing well. *Clinton*: Injured by cut-worms; some fields destroyed. *Calhoun*: Acreage increased from year to year considerably. The condition has been much reduced by cut-worms, which are very much less destructive on fall-plowed land. *Mecosta*: Promises well now. *Cass*: Some fields plowed up on account of injury by white grub-worm. *Emmett*: The crows, blue-jays and chipmunks have taken every stalk in some fields, and reduced the total acreage 25 per cent. There would have been an increase in area but for their depredations.

**INDIANA.**—*Huntington*: The first planting destroyed by the cut-worm. *Randolph*: Worms very destructive. Much has been replanted twice. *Madison*: Very much injured by grub and cut worms. *Morgan*: Never looked better. *Pike*: Cut-worm and army-worm together with rain in May delayed and injured the corn. *Kosciusko*: Cut and grub worms have been very troublesome. *Noble*: Backward, owing to late planting and the ravages of the cut-worm. *Hamilton*: Small for the season, and much damaged by grub and cut worms. *Greene*: Acreage reduced by heavy rains, which prevented the planting of much of the flat land. *St. Joseph*: Generally looks well on sandy soil, but on prairie and clay lands damaged to the extent of one-half by grub and cut worms. *Brown*: Growing splendidly, and with a continuance of the present favorable season the crop will be the largest ever grown. *Cass*: Very clean, and coming on finely since the cut-worm ceased its ravages. *Steuben*: The cut-worm has been so destructive that many fields have been replanted several times, and some sowed to buckwheat and other crops. *Wabash*: Good on the bottoms, but drying up on high land. *Wells*: On clover sod, corn had to be replanted several times on account of the cut-worm, and is kept back by drought. *Marshall*: Some fields damaged by grub-worms. *Marion*: Suffering much from cut-worms and other pests. *Bartholomew*: Splendid prospect.

**ILLINOIS.**—*Marshall*: Fine prospect. Season good for cultivation. *De Kalb*: Two weeks late, but color good and growth vigorous, promising an average yield. *Sangamon*: Most fields clean and growing finely. Drowned out in some places along the river by the overflow in June, and, although replanted as late as June 24, may yet make a crop. *Stephenson*: Ten days later than last year, but stand good and growing finely. *Washington*: Looks well, but in some parts of the county it will be destroyed by the chinch-bug. *Will*: Less acreage, and the stand injured on newly-broken sod by the cut-worm. *Perry*: Would be in better than average condition but for the chinch-bug. *Fayette*: Will be seriously damaged by chinch-bugs if it continues dry. *Carroll*: On newly-broken ground the cut-worm has necessitated replanting. The weather rather cool till recently. *Macoupin*: Promises well. *Clinton*: Looks well now, but unless rain comes soon will be greatly damaged by the chinch-bug, which is now at work. *Mason*: Acreage planted equal to last year, but fully 5 per cent. lost by overflows, and the crop two weeks later than last year. *Bureau*: Not so forward as last year, but doing well. *Boone*: Very backward till June 15, but improving rapidly since. *Ogle*: Weather favorable and growth rapid. *Mercer*: Late, and drowned out on some bottoms. *Livingstone*: Indicates a lighter crop than last year. *Knox*: Growing very fast and nearly up to average condition. *Pope*: Suffering for rain. *Crawford*: Much damage threatened by the chinch-bug. *Effingham*: The destruction of the crop by the chinch-bug feared unless the remainder of the season should be rainy. *DeWitt*: If the season continues favorable the crop will be enormous; fields unusually free from weeds, &c. *Lee*: Backward, but growing rapidly. *Winnebago*: Growing rapidly. *McDonough*: Acreage fully up to average, and condition fine. The early part of the season was so wet that much flat land intended for corn could not be planted.

**WISCONSIN.**—*Portage*: Backward owing to cool weather in June. *Waukesha*: Stands well, and doing finely. *Douglas*: Continued wet weather delayed planting in some cases till June 25. *Washington*: The crop will be only moderate, owing to the rotting of a portion of the seed during the very rainy season. *Pierce*: Fully half the corn rotted in the ground, owing to the cold, wet weather. *Jackson*: Very poor. *Saint Croix*: Very backward until recently. Improving rapidly now, and may make a crop. *Green*: Late, and looking badly, but if the next two months are favorable we hope for a crop. *La Fayette*: Good stand, and growing finely. *Calumet*: Cold and wet at the time of planting, so that much seed rotted in the ground; the wire-worm also destroyed

much, and the replanted portions are not very thrifty. *Dunn*: Wet for corn, and much injury done by cut-worms and blackbirds.

MINNESOTA.—*Sibley*: Kept back by cool weather and rains. *Benton*: Has been somewhat backward, but now growing finely. *Ramsey*: Rather wet for corn. *Watowwan*: Poor. *Noble*: A considerable portion of the crop just coming up; it will take a late season to make a crop. *Sherburne*: Good stand, but backward and weedy. *Freeborn*: There will not be half a crop. The planting season was so wet that much of the corn-ground was seeded to oats and barley, and the stand was greatly injured by gophers, blackbirds, and the rotting of seed. The little that remains of the first planting looks well. *Murray*: Average condition. *Steele*: Backward, but growing finely now. *Meeker*: Was much injured by blackbirds, some fields being almost destroyed; condition otherwise good. *Houston*: The wet weather caused much seed to rot in the ground, and the depredations of gophers injured the stand also; but June has been very favorable, and the crop has come forward rapidly. *Nicollet*: Doing well. *Wright*: Very backward. Three weeks later than last year. *Wabashaw*: Very backward; stand poor; many fields plowed up and seeded to buckwheat. *Fillmore*: Backward, but growing rapidly.

IOWA.—*Clinton*: Since June 17 the season has been favorable, and, with a late fall, the crop may be good. *Cedar*: Cold, backward spring, followed by heavy rains, has set the corn back, and given a poor stand, but it is improving under the warm weather of the past ten days. *Chickasaw*: Planted late, but growing very rapidly. *Buchanan*: Backward from late planting and poor seed. *Tama*: Very poor stand, owing to wet, backward spring. *Muscatine*: Rapidly recovering from the effects of the wet, cold spell in May and June, but the grub-worm is still at work. *Scott*: Small and backward owing to late planting, but, with a favorable season, may yet make a full crop. *Pocahontas*: Acreage less than formerly, and the crop rather backward from wet weather. *Hardin*: Planting delayed from ten to twenty days by wet weather. *Howard*: Planting late, and growth retarded until June 16. Favorable weather since then. Much damage done by gophers. *Henry*: Growing finely except on low ground and sloughs, where it is a failure. *Linn*: Backward owing to the late spring, but growing well now. *Clayton*: Ten days late, and 15 per cent. washed out when too late to replant. *Pottawattamie*: Small for the season, but growing finely. *Des Moines*: A large portion of the crop was drowned out in May, and replanted in June; some as late as the 25th. *Lee*: Planting was continued as late as June 25; and much corn-land will still remain idle. The crop must be less than an average. *Marion*: Weather very favorable. *Polk*: Backward at first, but now growing rapidly, and promises a good crop. *Plymouth*: Has been kept back by cold, wet weather, but is growing well. *Iowa*: Small for the season, but looking well. *Shelby*: Much corn planted late, but the crop looks well. *Jasper*: Backward; cannot make over three-fourths of a crop. *Winnesick*: Most of the crop was planted late, and it will require good weather throughout the season to make an average crop, as it is still small, though growing well. *Grundy*: Backward, but the stand and color good, and every indication of a heavy crop. We have millions of bushels of good old corn, which can be bought for 18 cents per bushel. What shall we do with it? *Mitchell*: Small, but growing fast, and promises well. *Hancock*: Rather backward, owing to cold rains early in the season, but doing finely now. *Monona*: Nearly ten days later in planting than last year, but favorable weather recently has brought the crop forward well.

MISSOURI.—*Lincoln*: Looks splendidly. *Chariton*: Planting delayed by rains, which also interfered with cultivation prior to June 15. *Jackson*: Well cultivated, and in excellent condition. *Moniteau*: Planted unusually late, and now threatened by drought as well as the chinch-bug. *Benton*: Excessive rains delayed planting and greatly injured corn in the ground. *Saint Clair*: Planting delayed by wet weather. *Caldwell*: Some planting done as late as June 20, and much low bottom land will remain unplanted, owing to very wet weather. *Carroll*: Needing rain, but yet the prospect is good; acreage greatly increased. *Grundy*: Continuous rains from April 20 to June 10 prevented the planting of much bottom land, and interfered with the working of hill-lands, so that the prospect is poor, especially as the chinch-bug has made its appearance. *Marion*: Larger acreage than usual, and condition good now, though the chinch-bug is in some fields. *Livingston*: Planted late, owing to backward season, but now in remarkably fine condition. *Reynolds*: Fine condition. *Cass*: Planted late, but looks well. *Daviess*: Acreage reduced 50 per cent. by continuous rains in the spring, and the crop backward. *Clay*: Planted late, but promises well. *Worth*: Does not look well, owing to a delay of three weeks in planting, caused by wet weather. *Nodaway*: The weather was so wet that corn was planted late, and on poorly prepared fields, so that it is backward now. *Harrison*: Planted late owing to wet weather, and growing slowly, with a prospect of much damage from the chinch-bug. *De Kalb*: The planting season extended from May 6 to June 22. Stand good, and receiving thorough culture. *Sullivan*: If the drought continues the damage done by the chinch will be great. *Cole*: Planted exceptionally late, and much land intended for it not planted. Stand good. *Johnson*: Attacked by the chinch-bug in some places.



KANSAS.—*Riley*: Increased acreage, caused partly by the failure of winter-wheat. *Leavenworth*: Fifteen per cent. of the land intended for corn could not be planted owing to wet weather, but the weather has been favorable of late, and a crop is expected. *Rice*: Looks well generally, though in some places there is complaint of injury by grasshoppers. *Wyandotte*: Planting late, owing to wet weather, but the crop coming on finely now. *Cowley*: Looks fine. *Osage*: Exceedingly small for the season. *Marion*: A little backward, but looks well. *Coffey*: Much planted very late, owing to wet weather. *Shawnee*: Uneven, but looks well. *Cloud*: Looks well, but needs rain. *Neosho*: Generally good, though some fields have suffered from the excessive rains, which prevented proper cultivation. *Douglas*: Planting retarded by rains, but prospect encouraging now.

NEBRASKA.—*Merrick*: Late, but good. *Hall*: Cold, backward spring, delaying planting a week, yet the stand is good, and with a favorable season an average crop may be made. *Washington*: The increase in acreage is owing to the influx of population. *Boone*: Acreage very large. *Cuming*: Somewhat late, but stand good and growing fast. *Nemaha*: Owing to the low price there was a decrease of acreage planted this spring.

CALIFORNIA.—*Contra Costa*: A slight increase in acreage, and looks well. Is raised only for roasting-ears, though it grows well upon rich and well-pulverized soil, without rain or irrigation. *Humboldt*: Only grown along the sea-coast for roasting-ears; in the interior the land too hilly for extended culture.

OREGON.—*Douglas*: Needs rain, but with a favorable season will make a good crop. *Columbia*: Sickly and yellow in appearance from continued cold sea-winds.

THE TERRITORIES.—*Santa Fé, New Mexico*: Very promising. *Minnehaha, Dakota*: The first stand was almost entirely ruined by excessive rains, depredations of birds, and from poor seed, so that the crop is small at this time. *Yuma, Arizona*: Not planted till after the overflow of the Colorado, in the early part of July. *Kane, Utah*: Some little complaint of injury by caterpillars.

## WHEAT.

An improvement in the condition of wheat has occurred, since our last report, in New York, Maryland, Virginia, Michigan, Missouri, Kansas, and to a slight degree in some other States; while a small decline is reported in Ohio, and in some of the Southern States. The averages in the winter-wheat States stand as follows: Connecticut, 94; New York, 78; New Jersey, 69; Pennsylvania, 69; Delaware, 75; Maryland, 57; Virginia, 99; North Carolina, 112; South Carolina, 103; Georgia, 102; Alabama, 116; Mississippi, 108; Texas, 145; Arkansas, 106; Tennessee, 105; West Virginia, 95; Kentucky, 112; Ohio, 75; Indiana, 88; Missouri, 66. Of the States producing almost exclusively spring-wheat—Maine, 108; New Hampshire, 103; Vermont, 104; Wisconsin, 101; Minnesota, 110; Iowa, 108; Nebraska, 112; Oregon, 95; California, (which is not fully reported,) 120 for early sown, and 112 for late; Kansas, spring 95, winter 60; Illinois, spring 104, winter 92; Michigan, spring 98, winter 81. The average of condition for the United States is almost exactly the same as in June, or 94, 6 per cent. less than average.

The quality of the grain is uniformly superior. In the Middle States, in Ohio, Michigan, and Missouri, and wherever inferior condition is reported, the straw is short, but the heads are generally long and well filled, the kernel plump and heavy. The quality of southern wheat will probably prove as fine as any ever produced in that section. In threshing, the fullness of the heads, in proportion to quantity of straw, causes the yield to exceed the expectation, and may go far to offset the small decrease in reported condition. It is quite probable that the general excellence of the grain will make the present crop of equal value to that of last year. There has been almost entire exemption from rust, and comparatively little complaint of insects. The Hessian fly is reported in several places, more numerous in the Ohio Valley, and the chinch-bug has caused losses in many counties of Illinois, Iowa, and Missouri.



Several kinds of wheat distributed by the Department are proving desirable acquisitions. The Ushak variety has been sold in Virginia for \$5 per quart. The Tonzelle, a French variety, is claimed to be 20 per cent. better than any other in Culpeper, Virginia. The Fultz wheat is a very promising variety, though it has had but one year's distribution. The Tappahannock, first distributed nearly ten years ago, has been highly esteemed in various sections of the country, but appears to be declining at some points, as an old variety.

In Maine, only two counties send reports of condition less than 110. The great wheat county of Pennsylvania, Lancaster, which has yielded 2,000,000 bushels, stands at 75, while the State averages but 69. In Kentucky the figures in several prominent counties range from 110 to 133. The uplands of West Virginia are less favorably reported than the Kanawha Valley. Throughout the South, as shown in extracts from correspondence, the crop is better in quantity and quality than for many years. In Dallas, Texas, the yield is reported as ranging from 21 to 37 bushels per acre; in Williamson, from 25 to 35 bushels; in Blanco, 16 bushels, through the county, many of the fields producing 20 to 30 bushels per acre. In Tennessee similarly large yields are reported; in Knox County, from 27 acres 690 bushels of Tappahannock being thrashed, or nearly 26 bushels per acre. While the average for Ohio is low, Scioto County reports the best crop in twelve years. Throughout the Ohio Valley the harvest is late, many reports making it two weeks later than usual. The wheat-fields of Missouri have been devastated the present year by winter frost, by chinch-bugs, which have eaten whole fields of spring-wheat as fast as the plants appeared, by the Hessian fly, and by destructive floods which have deluged bottom-lands. A field of 7,000 acres, yielding 20 bushels per acre, is reported as the property of one farmer of Alameda County, California.

NEW YORK.—*Yates*: Crop prospects improved. *Jefferson*: Such winter-wheat as escaped winter-killing looks well. Spring grain on low land partly drowned out; on drier lands it is greatly improved; will be average. *Wyoming*: Promises 15 bushels per acre. *Steuben*: Winter-wheat about 78 per cent.; spring crop promising. *Genesee*: Two-thirds of a crop. *Cattaraugus*: Prospects favorable. *Dutchess*: Late rains have improved the crops. *Otsego*: Spring grain fine. *Livingston*: Winter-wheat past redemption on clay soils, but many fields have been greatly improved by late rains; crop less than half of last year's, which was the best in fifty years. *Queens*: Light; harvested in good condition. *Erie*: Winter-wheat looks well, but is spotted. *Onondaga*: Winter-wheat thinned by freezing, but doing finely now; heading heavily.

MAINE.—*York*: Growth rank.

NEW JERSEY.—*Morris*: Improved by late heavy rains. *Monmouth*: Grain of good quality. *Gloucester*: Yield 20 per cent. below average.

PENNSYLVANIA.—*Westmoreland*: Fultz wheat doing finely. *Franklin*: "Shelter weed" has taken the place of wheat, to a great extent, but it does not pay. *Lebanon*: Very short in straw; old Mediterranean the best; fancy varieties almost a total failure. *Cumberland*: Harvest two weeks late. *Lancaster*: Crop improved. *Bucks*: Short and thin, but of fine quality. *Lucerne*: Wheat that escaped winter-killing is 10 per cent. above average in condition. *Berks*: Stand thin, but heads large and filling well; crop about three-fourths of an average; harvest about 4th of July. *Bradford*: Improved by late warm and copious rains. *Mifflin*: Winter-killed; not over a half crop. *Tioga*: Winter-wheat better than was expected. *Fayette*: Half killed by winter and injured by the fly. *Clinton*: Winter-wheat a failure; or at most not over half a crop. *Clearfield*: Measurably recovered from winter cold; harvest late; fears of rust. *Indiana*: Promising. *Elk*: Greatly improved by late copious rains. *Northumberland*: Winter-wheat will yield double the estimate of the spring, or about half a crop. *Lekigh*: The wheat that came up has fine heads and is promising. *Lycoming*: Thin through winter-killing, but large-headed and greatly improved by late fine weather. *Butler*: Improved by late timely rains; crop half average. *York*: Well filled. *Montgomery*: Half a crop; shortened by drought.

MARYLAND.—*Baltimore*: Thin on the ground but well headed; no injury from insects or rust; crop about half average. Fultz wheat a great acquisition. *Talbot*: Not over a half crop. *Washington*: Scarcely four bushels per acre. *Montgomery*: Prospects

improving; straw short but heads well filled; some fields may average 20 bushels per acre. *Calvert*: Winter-wheat very greatly improved by the recent rains; crop will be better than for several years. *Queen Anne*: Straw short and light; quality of grain superior; probably not over a half crop.

**VIRGINIA.**—*Albemarle*: Short but well filled. *Clarke*: Prospects improved. *Mecklenburgh*: Light but of excellent quality; fly injurious in some places; ruined the Fultz wheat, which was very promising. *Nelson*: Crop short and light; heads unusually well filled; grain superior. *Washington*: More fly than last year; no rust yet; falling off 20 per cent. *Prince William*: Crop light. *Henrico*: Straw short but the crop average. *Prince George*: Of good quality and harvested in good order. *Surry*: Injured by drought. *Highland*: One-third of an average. *Fairfax*: Straw short but heads long and well filled; Fultz wheat a great acquisition. *Amelia*: Quality extraordinary; yield not large. *King and Queen*: Injured by hail-storm in May and also by drought. *Orange*: Greatly improved; promises a full crop of superior quality. *Culpeper*: Touzelle wheat, third crop from Department seed, is very fine; 20 per cent. better than any other. Fultz wheat promises finely. Ushak wheat has also created a sensation among farmers by the size and beauty of the heads; sold for seed at \$5 per quart. *Pulaski*: Excellent in quality; three-fourths of a crop. *Charlotte*: Straw short but grain good; expect to thrash out a larger crop than for ten years. *Spottsylvania*: Yield 50 per cent. above last year; lands usually yielding 4 to 6 bushels yielded 10 to 12 per acre. *Middlesex*: Early harvest; grain fine but straw short. *New Kent*: Better than usual; grain finer than any raised since the war. *Madison*: Straw short; grain fine; Fultz wheat very successful. *Craig*: Wheat better than was anticipated; Fultz wheat from the Department is highly esteemed; stalk strong; head well filled. *Smythe*: Crop excellent and secured in fine condition. *Stafford*: Crop fine, making up in quality for its deficiency in quantity. *Greenville*: What little wheat was sown was harvested in fine condition. *Henry*: Crop never better. *Fauquier*: Crop short but of excellent quality. *Angusta*: Crop equal to last year's.

**NORTH CAROLINA.**—*Gaston*: Grain perfect; yield 8 or 10 per cent. above average. *Granville*: Better than any crop within the past ten years. *Forsyth*: Better than for five years; grain very fine. *Chowan*: Grain very good. *Alexander*: Fultz wheat looks well, but is late, and liable to rust; healthy so far. *Henderson*: Yield better than for fifteen years. *Mecklenburgh*: Crop better than any since the war, or for fifteen years. *Rutherford*: Harvested eight days earlier than usual; crop good, 30 per cent. above average. *Bladen*: Good yield. *Randolph*: Crop larger than for years and of very good quality. *Person*: Never better; will turn out 25 bushels per acre; harvested early and generally housed. *McDowell*: Better than for several years; harvested in good order, but in danger of being injured in the shock by continued rains; Fultz wheat has done remarkably well. *Caldwell*: Best crop, probably, since 1859; Boughton does not yield as well as blue-stem; Fultz promises to be a success. *Ashe*: Fultz looks well, as also spring-wheat. *Hereford*: Much better than was expected. *Haywood*: Better than for fifteen years. *Burke*: Largest yield and finest grain in ten years. *Davies*: Heads did not fill well, but grains large and good. *Alamance*: A fair average; grain very fine; shortened on thin soils by drought. *Stanley*: Thrashing out finely; grain bright, full, and heavy; yield larger than usual; all varieties have done well. *Rowan*: Remarkably full grains; yield larger than was expected; largest crop since the war. *Rockingham*: Crop double of last year's. *Lincoln*: Crop promises to be the best for many years. *Moore*: Fine, and mostly harvested in good condition.

**SOUTH CAROLINA.**—*Lexington*: Better than anticipated, especially the Fultz. *Union*: Wheat very fine; 64 pounds to the bushel.

**GEORGIA.**—*Forsyth*: Excellent in the grain, but thin on the ground. *Catoosa*: Fultz wheat did remarkably well. Two quarts of seed from the Department produced 1½ bushels, though sown on the poorest land on the farm. Nearly every head came out the same day, and the whole ripened with singular uniformity. It may, probably, on the best land, be made to yield from 25 to 40 bushels per acre. *Sumter*: Wheat found to be a profitable crop. *Gordon*: Grain extra fine; crop thin. *Wilkes*: Grain fine, but yield not up to expectation. *Lumpkin*: Ushak and Fultz wheat fully answer expectations; heads of Fultz very heavy. *Murray*: Best crop in ten years. *Gwinnett*: Good average. *Oglethorpe*: Under average. *Franklin*: One quart of Fultz wheat from the Department yielded 70 quarts. *Whitfield*: Crop good. *Lincoln*: Grain good, but the crop greatly reduced by winter-killing. *Fannin*: Winter-wheat fine. Fultz wheat from the Department did well; a quart of seed sown broadcast yielded a bushel of grain. *Cobb*: Crop good.

**ALABAMA.**—*Colbert*: Universally good. *Saint Clair*: Superior. *Morgan*: Best crop in eight years.

**MISSISSIPPI.**—*Newton*: Acreage small, but yield better than for ten years.

**TEXAS.**—*Fannin*: Yield over 20 bushels per acre. *Dallas*: Best crop ever raised here; averaging from 21½ to 37½ bushels per acre. *Red River*: Fine crop harvested. *Ellis*: Crop thrashing out from 23 to 41 bushels per acre; best crop ever made here. *Kendall*: Winter-wheat will average 20 bushels per acre. *Williamson*: Will average 25 to



35 bushels per acre. *Blanco*: Winter shortened by rust one-fourth; spring-wheat thrashed out 16 bushels per acre. *Johnson*: Yield larger than was expected. *Bezar*: Crop very superior. *Hamilton*: Finest crop ever raised, though somewhat thin on the ground. *Bell*: From 20 to 30 bushels per acre. *Lampasas*: Unusually good; average yield 22 bushels per acre; one farmer averaged 42 bushels.

ARKANSAS.—*Washington*: Acreage small; condition above average. *Madison*: Injured 10 per cent. by "spot."

TENNESSEE.—*Dyer*: Crop above average; from 15 to 25 bushels per acre; Red Chaff the favorite variety; matures early and grows luxuriantly; well suited to thin lands; very large and plump; said to yield more flour than any other variety; less liable to rust than any other yet tried. *Fultz* and *Touzel* mature too late for the climate. *Rhea*: Crop of excellent quality; the best for ten years. *Smith*: Crop excellent as ever made in the county, and very abundant; proportion of grain to straw unusually heavy. *Decatur*: Crop good. *Hancock*: Harvested in good condition; best crop for several years. *Coffee*: Crop average and of excellent quality;  $4\frac{1}{2}$  quarts of Fultz from the Department yielded  $8\frac{1}{2}$  bushels. *Green*: Remarkably plump, and will thrash out heavy. *Monroe*: Some fields average from 33 to 36 bushels per acre; grain of the finest quality; others may not average above 4 bushels. *Fentress*: Extra in quantity and quality. *Madison*: Winter-wheat shortened 10 per cent. by rust. *Wayne*: Yield double of last year's. *Robertson*: In good condition and of good quality. *Stewart*: Best yield since 1865. *Bradley*: Excellent, but thin; seed defective. *Serier*: Best crop since 1863. *Gibbs*: Better than for many years. *De Kalb*: Prospect fine. *Cannon*: Never better; 50 or 60 per cent. above last year. *Polk*: Fultz wheat has done well. *Jefferson*: Yield below average; quality fine. *Roane*: Fine, but thin on the ground. *Lawrence*: Best crop, both in quantity and quality, since the war. *Lincoln*: Twenty per cent. above average; heaviest crop in ten years; Fultz promises well, though it rusted worse than either the Walker or Boughton varieties; wheat will average 20 or 25 bushels per acre. *Rutherford*: Better than for five years; will average 12 bushels, some crops making from 20 to 25; grain excellent; acreage reduced 53 per cent. *Haikins*: Best crop since 1863; harvest a week early; yield large and fine. *Hickman*: Yield greater than since 1861—16 bushels per acre. *Davidson*: Quality never better, but yield shortened by drought. *Sullivan*: Wheat greatly improved prior to cutting; many fields ruined by the fly; but on land well prepared and well manured heavy crops of extra grain were harvested; on many heads as high as 90 grains have been counted. *Macon*: Spring-wheat better than the winter crop; earliest varieties the best; winter-wheat thin on the ground, but well headed. *Knox*: Boughton wheat yielded 690 bushels on 27 acres. A gallon of Fultz wheat from the Department, sown on one-tenth of an acre, yielded 5 bushels; grain splendid.

WEST VIRGINIA.—*Braxton*: Crop very good; thin in some places, but well filled, and of fine quality everywhere. Harvest commenced June 22. *Berkeley*: Better filled than for years. *Putnam*: The crop rather above average; not very good on uplands, but better in the valley of the Great Kanawha. *Tappahannock* generally sown, but does not yield as much as Lancaster or Mediterranean. Every variety "runs out" if continuously planted. The midge rather more troublesome than usual, but has not materially damaged the crop. *Tyler*: The crop very variable in different localities and exposures. On good uplands the yield will be satisfactory, but on some of the bottoms not a fourth of a crop will be made. Drilling and plowing in are the only security against winter-killing. *Morgan*: Harvest nearly over, and although the wheat is thin, it is so well filled that the yield will be a full average. *Harrison*: Well filled, but the crop below an average. *Cabell*: Acreage much reduced by drought last fall, but the quality better than for years. *Kanawha*: Never better headed. *Jefferson*: Harvest over; straw light, but heads well filled with good grain. The Fultz variety splendid. *Monongalia*: The yield will be about one-third of last year's; quality good. *Monroe*: Some injury from the fly, but many crops above average.

KENTUCKY.—*Clarke*: Best crop for eight years past. *Shelby*: Wonderful improvement in the crop from seasonable rains; no increase in acreage, but the yield will be 25 per cent. above an average of the past six years. Harvest nearly over. *Taylor*: Harvest progressing and the grain uncommonly large and fine. One quart Fultz wheat sowed October 1 and cut June 20; yielded one bushel of splendid grain after a loss of 10 per cent. from winter-killing. *Hardin*: The Fultz wheat has matured well and has very large, long heads. A yield of three bushels is expected from one quart of seed. *Fayette*: Small area sown; quality of berry unsurpassed. *Warren*: Harvest just over; acreage 20 per cent. below average, but quality very superior. *Lincoln*: Remarkably good; grain large and sound. *Pulaski*: Harvest over. *Mercer*: Best crop since 1855; acreage much less than last year, but the grain very heavy and well filled. The Fultz variety, sown September 20, stood the winter well, and grew vigorously in the spring; heads good and well filled for two-thirds of their length, but the rest of the way with small and imperfect grains. We think acclimatization will obviate this objection. *Owen*: Crop below average from winter-killing and the ravages of the midge. *Hopkins*: Extra crop. *Spencer*: Acreage 30 per cent. less, but quality 25 per cent. better and yield

100 per cent. greater than in 1871. *Butler*: Better than for many years; harvest over. *Carroll*: Winter-wheat badly frozen out. Quality will be good if not injured by wet in the shock. *Anderson*: Harvest nearly over and the finest crop since 1855. *Hart*: Yield average; quality never better. *Edmonson*: Decrease in acreage but condition fine. *Clinton*: Crop very fine; large heads, plump grain, and no rust. *Ohio*: Yield more than double that of last year. *Russell*: The crop will be three times that of last year, and 25 per cent. above an average. A few fields injured by rust. *Nelson*: Excellent crop; berry very fine. *Scott*: Late wheat reduced 25 per cent. by the midge. *Henry*: More than an average crop; harvest nearly over.

**OHIO.**—*Logan*: Winter wheat has had a succession of adverse circumstances to contend with. An unusually dry fall prevented sufficient growth to protect the roots during the winter, and it was therefore exposed to the dry, cold winds, which injured without actually throwing it out, so that farmers were encouraged to hope that it might revive, until it was too late to break up so large a breadth of land for other crops. I think it safe to estimate that 40 per cent. of the winter-wheat will not pay for harvesting. Where the wheat was turned under, corn, oats, and beans were substituted. *Miami*: The crop will be 75 per cent. of an average. It has filled well, and where it escapes the fly will make a full crop. *Medina*: Has improved very much within the past month, and now promises 80 per cent. of an average crop. *Vinton*: Hard winter; fly and weevil will reduce the crop more than one-half. *Fultz* and *Australian* spring wheat promise well. *Franklin*: Ruined by drought on clay lands where not in good condition. *Butler*: Harvest commenced June 25, and will be over by July 5. Forty years ago it was never begun before July 4. The product will vary from 3 to 30 bushels per acre. *Adams*: Filling well, but very thin; many fields not being worth harvesting; others, however, will produce an average crop, and we will probably have nearly as much in the aggregate as last year, which was about half a crop. *Coshocton*: Harvesting not commenced. Last year it was over by July 1; we do not expect more than a return of the seed sown. *Ross*: Invariably good on low and poor on high lands; harvest commenced. *Scioto*: Best crop for twelve years. *Pickaway*: Two or three seasonable rains in June have improved the prospect of the crop. The straw is thin but the heads well filled and quality of grain excellent. *Highland*: Harvest fairly commenced. Straw light, but good-sized heads and plump berry. *Morrow*: Some improvement within the past month in fields not plowed up and seeded to other grains. *Delaware*: Injured by dry weather in June. *Brown*: Not injured by the drought; now in harvest. *Lorain*: Rusting in some localities. *Huron*: Winter-wheat very good. *Athens*: Very light crop but grain plump. *Wood*: Will probably be little over half a crop, but of good quality. Favorable weather since the 1st of June has improved the prospect much. *Columbiana*: Has turned out much better than was anticipated.

**MICHIGAN.**—*Bay*: Winter-wheat on both high and low lands was frozen out to a great extent, but where it escaped looks very well. *Wayne*: Thin on the land, especially in clay soils, but has improved wonderfully. *Livingston*: Thin on the ground and rank in growth; consequently likely to rust. *Lenaee*: Crop shortened by dry fall and severe winter. *Washtenaw*: Twenty per cent. below average. *Clinton*: Badly winter-killed, but improved remarkably in June. *Calhoun*: Harvest from ten days to two weeks late. *Lapeer*: Light crop, though it has improved much within a month past. *Macomb*: Where winter-wheat was not entirely killed out, it has improved wonderfully. *Cass*: Harvest at hand. Excellent berry, but some smut and weevil. *Shiawassee*: Much improved by recent rains, and a prospect of 75 per cent. of an average crop. Harvest two weeks late. *Monroe*: Thin, but remarkably well headed.

**INDIANA.**—*Floyd*: Unpromising till recent rains, which have brought it up to an average. *Warwick*: Better crop than for twenty-five years. *Madison*: Poor. *Orange*: Has improved beyond expectation since June 1, and four-fifths of the crop harvested in good condition. *Switzerland*: Forty per cent. below average, owing to winter-killing from lack of snow. *Vanderburgh*: Reports of injury from the army-worm and bug appear to have been unfounded. *Morgan*: Has improved remarkably and promises a full crop. *Pike*: Very fine. *Kosciusko*: Damaged by hail in some places. *Noble*: Generally well headed, but the crop will be 40 per cent. below average. *Hamilton*: Harvest commenced June 25; well filled and of fine quality. *Saint Joseph*: Will be an average crop; ready to harvest by July 5. *Clarke*: Was thin through the winter, but has a good head and is well filled. *Brown*: Thin, but well headed and filled with excellent grain. Will all be harvested within a week. *Cass*: In the midst of harvest. Grain good and straw bright. *Parke*: Quality of the crop very good, though considerable damage has been done by the midge, which has been heretofore unknown. *La Grange*: Many fields plowed up and bare spots in those remaining, but the heads are unusually long and what remains promises well. Harvest two weeks later than last year. *Gibson*: Harvest over. Quality, yield, and condition good. *Wabash*: Half through harvest. The heads well filled. *Marshall*: Harvest commenced. The crop reduced 15 per cent. by the fly. The *Fultz* wheat looks well. *Marion*: The crop will be above an average, owing to favorable spring weather; no rust or insect enemies.



*Starke* : Drought has injured spring-wheat very much. *Posey* : The crop will be nearly double that of last year.

**ILLINOIS.**—*Madison* : The chinch-bug has recently appeared in great numbers, reducing the quality and quantity of the crop 20 per cent. *Marshall* : Quality excellent, but yield 50 per cent. below average. *De Kalb* : Very fine, but the danger to spring-wheat from chinch-bugs not yet over. *Lawrence* : Harvest nearly over; heads well filled, but thin on the ground; considerable damage done by fly and chinch-bug. *Washington* : Harvest nearly over, and crop good. *Perry* : Harvest over; crop good in the western part of the county, but much damaged by chinch-bug in the eastern portion. *Fayette* : Crop unexpectedly good, little damaged by the chinch-bug. *Macoupin* : About half the wheat cut; probable yield 10 bushels per acre; quality good. *Clinton* : Winter-wheat all cut, and thrashing will commence immediately; nearly every field injured by the chinch-bug, which would have done far more damage but for heavy rains, which checked them for a time. *Saint Clair* : Ripened late, and it is feared will not turn out as well as was anticipated before harvest. *Putnam* : Winter-wheat badly frozen out, and very little spring sown, owing to the damage it sustained from the chinch-bug last year; not enough wheat raised in the county for bread. *Ogle* : Spring-wheat somewhat lodged by a recent storm, but if not more seriously injured will yield more than an average crop. *Union* : Unusually favorable harvest. *Clark* : In spite of some complaints of Hessian fly and chinch-bug the crop will be above an average. *Rock Island* : Some danger from lodging; if it escapes that the crop will be above average. *Pike* : Condition has improved fully 20 per cent. in the past three weeks; heads large and well filled. *Kankakee* : What little winter-wheat there is promises very finely. *Pope* : Excellent crop, and harvested in good condition. *Montgomery* : The yield will be about half an average crop, but the quality excellent. *Crawford* : There has been a great improvement in the crop since June 1, and the yield will be an average and the quality excellent. *De Witt* : The crop has improved remarkably, and although the stand is light the quality will be first rate, and yield greater than seemed possible a month ago. *Lee* : Prospect fine, the only fear being from lodging. *McDonough* : Promises a greater than average yield.

**WISCONSIN.**—*Portage* : Both winter and spring wheat heavy; the latter extra. *Waukesha* : Spring-wheat sowed four weeks later than the average time, but has done admirably; is heading June 25. *Fond du Lac* : Drought has reduced the expectations held out in June. *Saint Croix* : An extra crop expected. *Green* : Spring-wheat looks very well, but we hear complaints of the chinch-bug. *La Fayette* : Prospect good. *Calumet* : Winter and early-sown spring-wheat look pretty well, but the drought has damaged what was late sown, and if rain does not come soon, not much over half a crop will be raised. *Dunn* : Favorable season for a crop.

**MINNESOTA.**—*Sibley* : Winter-wheat looks well. It does well only in timber-lands. *Watoneau* : Spring-wheat in fine condition. *Sherburne* : The wet, cool weather has been favorable. *Murray* : Never looked better. *Steele* : First rate crop. *Meeker* : Looks finely, though somewhat lodged. *Houston* : Unusually fine. *Faribault* : Not so forward as usual. The white Australian wheat looking finely; heads large and long. *Wabashaw* : Promises well. *Fillmore* : Winter-wheat entirely frozen out; spring promises a fine crop.

**IOWA.**—*Montgomery* : All the winter-wheat in the northern part of the county killed by freezing. Some fields in the extreme southern portion will yield a fair crop. *Chickasaw* : Never looked better, but there are some reports of rust having attacked it. *Buchanan* : Some fields badly lodged. The growth very heavy. *Muscatine* : Spring-wheat never looked better; thick on the ground, and well filled. *Scott* : Growing luxuriantly. *Pocahontas* : More wheat and less corn grown than formerly. Crop looks well. *Howard* : Doing well. *Clayton* : The prospect finer than at any time since 1860. *Mahaska* : Spring-wheat looks well now, but the chinch-bugs are at work upon it, and may ruin the crop. *Johnson* : Spring-wheat looking well, though two weeks late, and not out of danger of rust. *Lee* : Winter-wheat considerably damaged by the Hessian fly, and by drowning out on flat-lands, but will still be 90 per cent. of an average crop. The winter and spring were very hard on it; and but for the general use of the drill there would not have been one-fourth of a crop. *Marion* : Winter-wheat very nearly ruined by winter-killing, rust, and chinch-bugs, which latter pests have also attacked spring grains. *Polk* : Spring-wheat somewhat rusted early in the season from excess of rain, but has recovered, and is in good condition. *Plymouth* : Winter-grain so frozen out as not to be worth harvesting. *Iowa* : Spring-wheat promising. *Shelby* : We have the best prospect for spring-wheat ever seen. *Grundy* : Now in bloom, and promises a heavy crop. *Mitchell* : Spring-wheat has seldom looked better, though grain crops are never certain until cleaned and measured. *Hancock* : Never better. *Monona* : Uneven in places, but some of the finest fields ever seen.

**MISSOURI.**—*Saint Louis* : Yield 70 per cent. of last year's; quality 10 per cent. above average. Harvest over. *Putnam* : About ready to cut; some fears of injury from the chinch-bug if the dry weather continues. *Lincoln* : Almost an entire failure, in the western part of the county, from winter-killing. Some fields in the timber-lands of

the eastern part are nearly up to average. *Platte*: Winter-wheat almost a total failure from the severe winter and the ravages of the grub-worm in the spring. *Barton*: Winter-wheat almost a failure. *Carter*: Harvest over. The Tappahannock is very fine, but other varieties are not so good. The Fultz a perfect failure. *Jefferson*: Harvest about over. The crop badly winter-killed in some localities, and much injured by the chinch-bug. *Moniteau*: A failure; few farmers will harvest any. *Saint Clair*: What little survived the winter is being destroyed by the chinch-bug. *Caldwell*: The crop almost a failure, the chinch-bug injuring the little remaining. *Carroll*: Spring-wheat very fine, and the small portion of winter-wheat that is left is in good condition also. *Wayne*: Good in yield and quality. *Macon*: Nearly all the winter-wheat was frozen out, including the Fultz variety. The crop of the county will not be half an average one. *Grundy*: Ninety per cent. of the winter-wheat frozen out. The county will not raise the equivalent of seed sown. *Lewis*: Many fields plowed up. The chinch-bug has taken the spring-wheat as fast as it came up, and the Hessian fly has been very numerous. *Marion*: Harvest now in progress, and the quality of the grain very fine. The poor appearance in the spring caused many to plow up their fields, but the spring-rains improved the prospect much. *Montgomery*: In some localities it has been injured by the chinch-bug. *Livingston*: Injured by unfavorable winter and backward spring. *Reynolds*: The crop injured by the chinch and a small white worm which cuts the straw near the ground. *Cass*: Mostly plowed under; thin where standing. *Clay*: Winter-wheat almost a failure as to yield, and of poor quality. The little spring-wheat sown looks well. *Nodaway*: Spring-wheat promises finely. *Dade*: All destroyed on bottom lands by a great flood May 29. *Jasper*: A loss of 10 per cent. will be sustained from premature harvesting to escape the chinch-bug. *De Kalb*: Very poor crop; hundreds of acres plowed up and planted in corn, and some of those remaining will not be cut. *Perry*: The Fultz wheat did not do very well. *Iron*: Quality excellent and quantity above average, though the Hessian fly and chinch-bug have destroyed some fields. The Fultz wheat was sown in September and ripens early, and promising to be an improvement on the Tappahannock. *Dallas*: Considerably damaged by the chinch-bug. *Sullivan*: Harvesting will be done from July 10 to 20. *Hickory*: Not one-fourth of a crop. Many fields not worth cutting. The dry fall made sowing late, and much was winter-killed; the chinch-bug also did much injury in some localities. *Cole*: Scarcely a third of a crop, owing to winter-killing. *Barry*: Has improved since June 1; the heads well filled with good grain. *Johnson*: Very light, and many fields plowed up and planted in corn, owing to winter-killing and ravages of the chinch-bug in the spring. *Phelps*: Winter-killed badly, and thin on the ground, but well headed and filled with grain of superior quality. *Pemiscot*: Little wheat raised, owing to the frequent overflow of the Mississippi. It grows well when not flooded.

**KANSAS.**—*Marshall*: The fields of winter-wheat that were not resown to spring-wheat have produced full, plump grain, but the yield is very little, owing to winter-killing. Spring-wheat promises considerably more than an average crop. *Brown*: Small acreage of spring-wheat sown, owing to scarcity of seed and fear of the chinch-bug. The condition of the crop was never better, with few bugs so far. *Riley*: Winter-wheat a failure, and some of the land planted in corn. Spring-wheat very promising. *Linn*: Winter-wheat badly frozen out, but what remains looks well. The chinch-bug has injured a portion of the little spring-wheat grown. *Leavenworth*: A failure. *Woodson*: Not one-fourth of a crop. *Wyandotte*: Winter-killed to a very great extent. Plowing or drilling in the seed is considered the best means to prevent freezing out. *Cowley*: Better than was anticipated in the early spring, standing thicker, and well filled. The Australian wheat was blasted by rust; the Fultz looks well. *Miami*: Winter-wheat almost entirely winter-killed; spring light as usual, owing to the damage done by chinch-bugs. *Osage*: Almost a total failure. *Labette*: Fine crop. *Marion*: The little winter-wheat that was not frozen out has been harvested. *Coffey*: Winter-wheat about half a crop, though of extra quality; spring-wheat now being cut. *Lyon*: Condition good; little winter-wheat in the county; harvest twelve days later than last year. *Shawnee*: Winter-wheat almost an entire failure; spring injured by the chinch-bugs in many localities. *Cloud*: The berry very fine, but thin on the land. *Neosho*: Harvest four weeks later than last year; stands very thin, but quality of grain good; some late fields injured by the chinch. *Cherokee*: Much better than was thought possible in the early spring, and many fields, which were thought worthless then, will produce six or eight bushels per acre; harvest two weeks later than last year. *Wilson*: Winter-wheat very poor, owing to late sowing, dry fall, winter-killing, and chinch-bugs; spring-wheat utterly destroyed by the chinch, including the Australian white from the Department.

**NEBRASKA.**—*Hall*: The Australian spring-wheat very promising. *Gage*: The Fultz wheat received and sown too late, and all frozen out; should have been sown in August. *Cuming*: Good prospect for a heavy crop; some red rust, but no apparent injury. *Dakota*: Fine prospect, but fears of lodging, as the weather is wet. *Thayer*: Prospect not much injured by the chinch-bug. *Nemaha*: Winter-wheat generally win-



ter-killed and the land put in other crops; spring promises a heavy yield, but not so much sown, partly owing to the scarcity of seed.

CALIFORNIA.—*Placer*: Harvest has commenced, and a bountiful crop will be saved, of excellent quality; the acreage is largely in excess of former years. *Contra Costa*: Excellent on sandy soils where early sown, and only slightly below an average on heavy soils sown late; the cool weather has been favorable. *Alameda*: Neither yield nor quality so good as was expected, owing to drought in some sections and rust in others. I have seen 7,000 acres of wheat in one field, the property of one man, which will average 20 bushels per acre, and upon an adjoining ranch they were cutting, thrashing, and sacking for market 65 acres per day. *Nevada*: Rather light. *Lake*: Nearly a failure; poorest crop since 1859. *Mendocino*: Better than was expected a month ago. *Amador*: An average crop. *Stanislaus*: The yield is better than was expected, and will be about 14 bushels per acre. A large increase in acreage will make the total product greater than any previous crop.

OREGON.—*Linn*: Fall and winter-sown wheat rather above average, but the recent drought and hot northerly winds injured spring-wheat. *Douglas*: Winter-wheat short and thin from the wet winter, and cold, dry spring.

THE TERRITORIES.—*Morgan, Utah*: Fifty per cent. of spring-grain destroyed by the grasshoppers. *Santa Fe, New Mexico*: Both winter and spring doing well. *Lewis and Clarke, Montana*: Finer than usual.

## COTTON.

The past month has been generally favorable to cotton. Limited areas have been affected by drought, but rains were quite general during the latter part of June. On the Atlantic coast showers have been so frequent and heavy, since June 20, as to delay cultivation and promote the growth of weeds and grass. Before that date a season of comparative drought of seven or eight weeks had been suffered in a portion of this district, while other counties represent the weather as having been uniformly favorable.

The variation in rainfall during the past month has been considerable in the Atlantic States, ranging as follows at the stations reported: from 1.2 inches to 4.95 in Virginia; from 1.75 to 5.49 in North Carolina; from 1.4 to 3.95 in South Carolina; from 1.25 to 4.96 in Georgia; from .4 to 6 in Florida; and from 1.55 to 4.89 in Alabama. In the States of the Mississippi the rainfall has been abundant, the lowest records in the several States being from 2 to 4 inches, and the highest from 4.5 to 11. In Tennessee the range is from 2.64 inches to 10.63; in Louisiana, from 4.35 to 11; in Texas, from 2.2 to 6.9; in Arkansas, from 4.3 to 8.2.

The States making averages lower than 100, the standard of good condition, are Virginia, North Carolina, and South Carolina, in which the average rainfall in May and June was light, and Arkansas, where injury has resulted from heavy and unseasonable rains. In all the other States the averages are above 100. The averages are as follows: Virginia, 96; North Carolina, 94; South Carolina, 97; Georgia, 101; Florida, 102; Alabama, 106; Mississippi, 109; Louisiana, 103; Texas, 105; Arkansas, 95; Tennessee, 104. Taking into consideration the relative importance of the States, in production, the general average of condition would be 103. As a whole, the July returns of the present year present a higher average of condition than those of any previous reports except those of 1868.

Of the 55 counties reporting cotton in Georgia, in 19 condition is below 100, in 21 above, while 15 return 100. Decatur, first in cotton-production, producing 43,000 bales in 1869, or one-tenth of the crop of the State, is placed at 100, Bibb and Warren 110, and less important counties 120 and 125.

The first cotton county in Alabama, Montgomery, stands at 100; Dallas, 110; and Wilcox, 100—three counties which produce one-sixth of

the crop of the State ; other counties of considerable importance at 120 and 125.

In Mississippi some of the principal counties report high condition : Hinds, 125 ; Madison, 120 ; Yazoo, and several others, 110 ; Washington stands at 90.

Fayette, in Tennessee, in 1869 producing 20,000 bales, is reported at 110 ; and Giles, a prominent county, is put at 110.

Tensas Parish, in Louisiana, yielding 25,000 bales in 1869, and producing in 1859 the unequaled crop of 141,000, though there were but 117,000 acres of improved land in the parish, is reported at 110 ; East Feliciana, 120 ; East Baton Rouge, 105 ; Concordia, Claiborne, Rapides, and other principal parishes, 100 ; and Caddo, yielding 26,000 bales in 1869, at 95.

Very little complaint is made of injuries by insects. The *aphis* is reported in several counties of the Carolinas ; and the "cotton-worm" is mentioned in Texas.

The following extracts from correspondence will further illustrate the subject :

VIRGINIA.—*Surry* : Culture increasing. *Prince George* : Cotton taking the place of peanuts.

NORTH CAROLINA.—*Gaston* : Crop late, and has not grown well till within a week. A fair season will make an average yield. *Bertie* : Late, but looking well ; there will be but few, if any, blossoms on the 4th of July. *Wake* : Too much rain ; but little prospect of an average crop. *Pitt* : Cotton badly in the grass and seriously injured. *Lenoir* : Wet weather has made the grass very troublesome. *Mecklenburgh* : Cotton looks finely where planted before the 15th of April ; later plantings not so good ; season good for working ; blossoms by the 15th of June, earlier than ever before known. A good season will make a splendid crop. *Bladen* : Growing finely, but four weeks behind time ; lice beginning to show themselves ; last year they were the forerunners of rust ; crop cannot be average. *Greene* : Bad stand ; drought at planting caused the seed to remain in the ground from four to six weeks ; condition of plants, 20 per cent. below par. *Onslow* : Looking well and growing finely ; almost three weeks later than last year. *Hertford* : Crop small, but thrifty ; exceedingly fine weather will be necessary for a full crop. *Beaufort* : Crop has suffered ; on ill-drained lands not over a third of a crop ; stand generally imperfect ; cut-worms at work ; this especially true in the case of lands that have long been in cotton. *Jones* : Cotton small, but promising. *Alamance* : Good. *Stanley* : Blooms plenty. *Rowan* : Condition excellent. *Lincoln* : Season fine for cotton. *Moore* : Backward through depredations of lice and cold nights. *Craven* : Generally a bad stand through unfavorable weather ; plants small, but healthy. *Franklin* : Very grassy through excess of rain. *Currituck* : Acreage increased ; growing finely. *Perquimans* : Started with an excellent stand ; cold nights during the first half of June reduced it ; now not over two-thirds, and full of lice. *Edgecombe* : Cotton a failure, through drought at seeding-time and excess of rain afterwards, producing grass and weeds.

SOUTH CAROLINA.—*York* : On light loam soil cotton was out of the ground early ; in clay soil the plants are late, and delayed by dry spring. The former class above average, and the latter below. *Fairfield* : Below average on account of drought and late planting. *Clarendon* : Promising, though late planted ; generally infected with lice. *Orangeburgh* : Suffering from lack of moisture ; crop clean. *Marlborough* : Early planted doing well ; late planted will require a favorable season ; lice on late plantings. *Newbury* : Cotton small and backward from late re-plantings ; early stands look well. *Anderson* : Poor and late stand. *Lexington* : Improving ; promises to excel last year's crop. *Columbia* : Stand imperfect, but prospects almost average. *Chesterfield* : A little better than usual, where fertilizers are used ; where not used, the crop is far below average.

GEORGIA.—*Muscogee* : Backward in many localities, though improved by late rains. *Liberty* : Short cotton supplanting the long staple and finer cottons even on the coast ; farmers working hard for a good crop. *Columbia* : Doing well. *Harris* : Cotton planting delayed and restricted by drought in April ; stand imperfect. *Quitman* : Crop has been well cultivated and looks well. *Worth* : Drought greatly injured cotton ; much did not come up ; much that did come up died ; \$1 per bushel is now offered for cotton-seed, the usual price being about 10 cents. *Sumter* : Condition varied ; where rain has been abundant the crop looks well ; where rain has been deficient crops are very poor. *Wilkinson* : Shortened by drought ; not a good stand. *Efingham* : Looking well. *Pulaski* : Prospect fine ; crop clean ; will be a full average. *Glynn* : Crop has



improved greatly, and is now doing well. *Lee*: Generally cleaned and of average promise. *Schley*: Looks well in spite of drought. *Wilkes*: Cotton-planting late, but this no disadvantage. *Marion*: Not injured by drought. *Gwinnet*: More promising than for many years; bloom 8 or 10 days early. *Oglethorpe*: Fertilized cotton doing remarkably well. *Lincoln*: Promises a good yield. *Macon*: No progress in three weeks. *Cobb*: Very fine. *Clay*: Promises a fair yield. *Laurens*: Largely failed to come up. *Meriwether*: Prospect remarkably good.

FLORIDA.—*Columbia*: Looks well, though the stand is imperfect. *Hillsborough*: Doing well. *Jackson*: Two weeks ahead of last year; promising with present weather. *Bradford*: Doing well; prospect better than any for ten years. *Alachua*: Recent rains have enabled cotton to overcome the evil effects of previous drought. *Gadsden*: Early-planted cotton in good condition; stand, however, imperfect; late cotton imperfect; may make two-thirds of an average. *Orange*: Long drought has injured cotton. *Wakulla*: Promising.

ALABAMA.—*Conecuh*: Great improvement on account of rains; first bloom June 4. *Colbert*: Crop looks well. *Pike*: Rarely, if ever, better cultivated; prospects fine. *Dallas*: Growth fine with excellent season. *Butler*: Doing finely. *Blount*: Promises a large crop. *Montgomery*: Promise above last year. *Calhoun*: Prospect full average. *Madison*: Best prospect in seven years. *Limestone*: Crop unusually well-worked and in fine condition. *Clarke*: Growing finely where well-worked; may be two-thirds of a crop. *Autauga*: Cotton backward, but in good condition. *Lauderdale*: In fine condition and growing fast; commenced blooming June 12; is in good cultivation. *Tuscaloosa*: Crops well-worked are doing well. *Franklin*: Cotton late planted, but bloomed June 22, about ten days earlier than usual; prospects fine.

MISSISSIPPI.—*Hancock*: Cultivation decreasing. *Warren*: Stand and condition improved. *Wilkinson*: Much of the crop grassy and growing too fast; running to leaf more than it can hold when drought sets in. *Wayne*: Better condition than last year, though later in gaining a stand; first blooms June 23. *Newton*: Better than for eight or ten years; acreage increased 10 per cent.; condition improved 50 per cent. over last year. *Grenada*: Cotton improved, but the stand very irregular. *Winston*: Early-planted cotton doing well; late planted very small. *Holmes*: Prospect good; too much cotton. *Clark*: Heavy rains give rise to fears that cotton will run to weed. *Tishomingo*: Crop prospects fine. *Noxubee*: Early-planted cotton promising. *Neshoba*: Doing very well. *Yalabusha*: Stand good; cultivation superior; promises more flattering than at any time since the war; blooms earlier, though planting was later than last year.

LOUISIANA.—*Red River*: Bad condition. *Richland*: Best prospect in 10 years. *East Baton Rouge*: Very promising. *Moorehouse*: In good condition. *Cameron*: Worms are at work. *Carroll*: In better condition than for several years. *Tensas*: Probably the largest crop since the war. *Winn*: Above average promise. *Concordia*: On good land the crop is growing rapidly; on "buck-shot" land it is smaller. *Rapides*: Better than in six years. *Claiborne*: Cotton superseding wheat and sugar-cane.

TEXAS.—*Fannin*: Promising; will be in blossom in fifteen days. *Hardin*: Heavier crop, probably, than since 1861; looks fine; some little show of worms. *Fort Bend*: 4,000 acres planted; 3,000 bales made last year; the stalks already average fifteen grown bolls each. *Victoria*: Cotton-worm appeared June 6. *Liberty*: Cotton growing well, but the worm has made its appearance in larger numbers than usual. *Red River*: Cotton promising. *Henderson*: Cotton growing fast. *Ellis*: Weather fine for cotton. *Kendall*: Acreage small, but crop promising. *Williamson*: Looks well. *Fayette*: Quite promising. *Milam*: Best crop for many years. *Smith*: Unusually healthy. *Johnson*: Looks well. *Bexar*: Fine. *Colorado*: Best crop since 1859. *Upshur*: Behind last year's crop. *Titus*: Better than for several years. *Rusk*: Looks well; better than last year; a single rain within ten days will carry it through July and August. *Grimes*: Hail-storms killed the young cotton in the western part of the county. *Bell*: Unusually promising, but the heavy rains are exciting fears of the worm.

ARKANSAS.—*Craighead*: Crop delayed by rain. *Union*: Crop in the grass. *Sebastian*: Fifty per cent. greater acreage in cotton than last year; injured by excessive June rains. *Crittenden*: Small and late in coming up. *Columbia*: Crop grassy, but partly cleaned, and looking well; stand good; crop promises to be heavy.

TENNESSEE.—*Decatur*: Crop promising. *Madison*: Small; drought after planting. *Wayne*: Looks fine. *Haywood*: Two weeks later than last year; grassy; acreage increased 10 per cent. *Gibbs*: Very promising. *Rutherford*: Acreage increased 15 per cent.; stand good and plants in good condition.

UTAH.—*Kane*: By extra cultivation, and manuring, 200 pounds of lint have been raised per acre, though the average will not be over 120 pounds. The shortness of the season and the necessity of irrigation are difficulties that cannot be easily overcome in cotton culture, which has almost entirely ceased in this locality.

## OATS.

The condition of the oats crop is from 1 to 6 per cent. above average in all the New England and Middle States, except New Jersey and Delaware; the former being 14 per cent. and the latter 20 per cent. below average. This shows a general improvement during the month of June in all the States except New Jersey, where the condition is 4 per cent. below that of the last report. In North Carolina the crop is 3 per cent. above average, showing an improvement of 13 per cent. during June. The other Atlantic States, and all the Gulf States, except Texas, are below average, though showing a general improvement since the last report. Texas is 10 per cent., Tennessee 3 per cent., and Kentucky 4 per cent. above average. West Virginia is 5 per cent. below, an improvement of 9 per cent. during June. Ohio and Indiana are below average, and have declined during the past month. The other States north of the Ohio River and west of the Mississippi are all above average. On the Pacific coast California is 13 per cent. above average, an improvement of 15 per cent. during the previous month. Oregon is 10 per cent. below average, a decline of 7 per cent. during June.

NEW YORK.—*Sullivan*: Never better. *Chenango*: Growing very rapidly. *Wyoming*: Fair for an average crop. *Steuben*: Very promising. *Livingston*: Very fine. *Erie*: Growing rank, and tending to fall before filling. *Onondaga*: Rank and thrifty.

NEW JERSEY.—*Sussex*: Injured by drought, but improving since late rains. *Mercer*: Very short.

PENNSYLVANIA.—*Franklin*: Crop benefited by rain. *Lancaster*: Short for the season, but with favorable conditions may yield a full crop; *Birlie* oats poor; *White Schonen* look well. *Berks*: Average. *Chester*: Shortened by drought. *Indiana*: Fine; promise over an average crop. *Elk*: Splendid. *Centre*: Promise an abundant yield. *Northumberland*: Promising. *Armstrong*: Rather rank; tend to lie down on rich, low land. *York*: Short; heads large and well filled; *Birlie* oats promise to be a success; over 3 feet high, large heads, and well filled.

MARYLAND.—*Montgomery*: Recent rains will make a good crop.

VIRGINIA.—*Albemarle*: Nearly nothing. *Clarke*: Improved by late rains; will probably make 40 per cent. of an average. *Washington*: Crop small. *Prince William*: Nearly nothing. *Henrico*: Spring oats not worth cutting; winter oats better, but not good. *Prince Edward*: Seriously injured by dry and cool May and June. *Prince George*: Spring oats almost a failure; winter oats well headed but short-strawed. *Surry*: Injured by drought. *Highland*: Backward, but improving with late rains. *Rockingham*: Retarded by hot, dry weather; light, and heading low; *Schonen* better than any others. *Fairfax*: Not half the oats sown will be harvested. *Amelia*: Shortened by drought. *Orange*: A failure, but good rains would improve the crop. *Fluvanna*: Shortened by drought. *King George*: Very low, but improved by late rains. *Culpeper*: Late rains have brought the crop to a half average; acreage decreased. *Charlotte*: Suffered much, and are very low; benefited by late rains. *Spottsylvania*: Oats redeemed from failure by soaking rains in the last ten days. *New Kent*: Suffered for rain. *Middlesex*: Spring oats not worth cutting; winter oats very fine. *Madison*: Almost an entire failure. *Augusta*: Failure. *Fauquier*: Failure.

NORTH CAROLINA.—*Forsyth*: Good crops. *Bertie*: Promise a fine yield. *Alexander*: Excelsior oats very fine looking. *Henderson*: Much improved, but will not make over three-fourths of a crop; Excelsior oats also deficient. *Mecklenburg*: Very good; winter oats the best. *Bladen*: Yield good. *McDowell*: Quite short, but well headed. *Ashe*: Excelsior looks well. *Hereford*: Crop will be heavy. *Davie*: Never better. *Alamance*: Thin in spots, but tall and well headed. *Rockingham*: Crop five times last year's. *Moore*: Very good. *Craven*: Best crop for many years.

SOUTH CAROLINA.—*York*: Poor, especially late sown. *Anderson*: Average, except upland spring oats, which drought renders not worth cutting. *Chesterfield*: Fall oats good; spring crop a failure.

GEORGIA.—*Muscogee*: Crop injured by rust and dry weather. *Chattooga*: Seasonable rains have improved the crop. *Catoosa*: *Schonen* oats doing admirably. *Sumpter*: More attention now paid to oats. *Gordon*: Grain extra fine; crop thin. *Wilkes*: Early fall sowings fine; spring sowings very poor. *Murray*: Drought severe on oats. *Walton*: Promising. *Gwinnett*: Average. *Oglethorpe*: Fall sown oats good; spring sown a failure. *Fannin*: Excelsior and *Schonen* oats doing well. *Cobb*: Better than last year.



FLORIDA.—*Bradford*: Shortened 25 per cent. *Columbia*: Yield lightened by drought. *Clay*: Increased cultivation.

ALABAMA.—*Conceh*: Half crop. *Colbert*: Shortened by drought. *Butler*: Materially injured by drought. *Russell*: Above average 15 per cent.; spring oats uncertain; the fall crop better.

MISSISSIPPI.—Red oats, a good crop. *Yalabusha*: Yield 25 per cent. above last year; heads good; straw medium. *Winston*: Excelsior oats; tall, and will do well if the rust does not take them; two weeks later than the common red oats. *Noxubee*: Nearly a failure from drought.

LOUISIANA.—*Red River*: Rust. *Claiborne*: More oats raised than of any other small grain.

TEXAS.—*Fannin*: Promising; Anti-rust oats the favorite; ripens early; yields 50 to 75 bushels per acre. Norway and other varieties grow too high and ripen too late. *Fort Bend*: Burnt badly. *Red River*: All oats rusted except White Schonen, which are fine. *Kendall*: Will average 30 bushels per acre. *Williamson*: Crop splendid; red oats thresh from 60 to 75 bushels per acre. *Fayette*: A variety of white oats, name unknown, yielded well without rust. *Harris*: None but experimental crops. *Hamilton*: Drought rendered a promising oat crop not worth cradling.

ARKANSAS.—*Crittenden*: Shortened by drought. *Madison*: Reduced 15 per cent. by rust.

TENNESSEE.—Crop good. *Coffee*: Injured by drought. *Madison*: Straw short; heads light. *Jackson*: Look fine; at least 40 per cent. over last year. *Robertson*: Late oats suffered by drought; late rains have greatly helped the crop. *Stewart*: Short strawed, but well grained. *Serier*: Suffered by drought. *Polk*: Schonen oats have done well for a dry season. *Roane*: Promising. *Rutherford*: Good; straw short; heads fine; average reduced 24 per cent. *Hickman*: Unusually fine. *Sullivan*: Better than for several years.

WEST VIRGINIA.—*Braxton*: Crop generally poor; some will be too short to gather. *Harrison*: Cut short by drought. *Cabell*: Promises well. *Fayette*: The crop bids fair to be a fine one. *Kanawha*: Has improved wonderfully. *Monongalia*: Very promising. *Monroe*: Not much raised now, but the crop looks well.

KENTUCKY.—*Clarke*: Suffering for ten days past from dry weather. *Hardin*: Medium. *Fayette*: Fine. *Lincoln*: Have suffered for want of rain. *Pulaski*: Injured somewhat by storms. *Mercer*: Schonen oats fine, tall, and well headed; promising to be extra good. Excelsior not so good. *Hopkins*: Excellent crop. *Anderson*: Condition good. *Hart*: Short, but well filled. *Russell*: Threatened with rust in some places, but generally look well, promising a heavy yield. *Nelson*: Fine crop. *Henry*: Very heavy.

OHIO.—*Miami*: Suffering for want of rain. *Ottawa*: Suffering from drought. *Union*: Damaged by drought; some fields heading out six inches from the ground. *Coshocton*: Drought will reduce the yield 25 per cent. *Scioto*: Unusually good. *Auglaize*: Want of rain will reduce the crop below an average. The cut-worms have also destroyed some fields. *Morrow*: Early sown especially promises a large yield. *Delaware*: Dry weather in June has damaged the crop considerably. *Huron*: Will be a very light crop.

MICHIGAN.—*Wayne*: Never looked better. *Livingston*: Need rain. *Washtenaw*: Splendid. *Gratiot*: Late oats suffering for rain.

INDIANA.—*Randolph*: Late sown oats ruined by drought. *Morgan*: Never better. *Pike*: Very fine. *Kosciusko*: Drought and hail ruined the crop in some places. *Noble*: Shortened by dry weather. *Greene*: Never better. *Clarke*: The finest crop I have ever seen in the county. *Brown*: Splendid crop. *Owen*: Fine seeding season; splendid crop. *Cass*: Late oats somewhat improved by recent showers, but that which was sown early is too far advanced. *Stark*: Much injured by drought. *Bartholomew*: The finest prospects ever known. *White*: Suffering for rain.

ILLINOIS.—*Lawrence*: Very fine. *Will*: Increase in acreage. *Mason*: Very heavy, and lodged to considerable extent. *Bureau*: Crop will be large if not injured by lodging. *Ogle*: Indications are that the crop will be above average. *Clark*: Finest crop ever raised; if not prostrated by storms the yield will be nearly twice an average. *Mercer*: Rank and lodging. *Livingston*: Much beaten down by storms. *Pope*: Promising; expect that the drought of the past three weeks may make the grain light. *Montgomery*: The largest crop for many years. *Effingham*: Never better. *Lee*: Fine yield if they do not lodge too much. *McDonough*: Unusually good prospect. *Franklin*: The heaviest crop ever grown in the county.

WISCONSIN.—*Fond du Lac*: Heading out at 6 inches in height in some places, owing to drought. *Saint Croix*: Uncommonly good. *Green*: Look finely. *Lafayette*: Good prospect. *Calumet*: Damaged by the dry weather in June. *Dunn*: Favorable season.

MINNESOTA.—*Freeborn*: Acreage much increased by the sowing of much land which could not be planted in corn, owing to wet weather. *Murray*: Never looked better. *Steele*: Very fine. *Meeker*: Condition good, though slightly lodged. *Houston*: Look very fine.

IOWA.—*Chickasaw*: Never better. *Buchanan*: Heavy growth, and some fields badly lodged. *Muscatine*: Fully 10 per cent. above average. *Scott*: Condition above average. *Howard*: Doing well. *Marion*: Attacked by the chinch-bug. *Iowa*: Condition good. *Jasper*: Never better. *Hancock*: Never looked better.

MISSOURI.—*Saint Louis*: Never better, but badly lodged by a severe rain and hail-storm which passed over two-thirds of the county on the 25th of June. *Lincoln*: Never promised better. Some farmers count on 60 to 75 bushels per acre. *Platte*: Already injured by drought, which, if it continues much longer, will prevent a large proportion of it from growing tall enough to be saved. *Carter*: The Schonen oats is looking very fine in spite of the drought. *Caldwell*: Splendid crop. *Carroll*: Never before so good. *McDonald*: The oats sent from the Department promise well. *Lewis*: Better than ever before, although some fields where corn was grown last year have been taken by the chinch-bug. The greatest danger is from lodging. *Marion*: Double the usual acreage, and promise well. *Montgomery*: Injured in some localities by the chinch-bug. *Livingston*: Splendid condition. *Reynolds*: Look finely. *Cass*: Condition only moderate. *Jasper*: Crop heavy. *DeKalb*: The yield will be good if it rains soon. *Sullivan*: Will be much damaged by the chinch if the drought continues.

KANSAS.—*Brown*: Acreage greater than usual, owing to winter-wheat land having been reseeded and sown in oats, which promise a heavy crop. *Rice*: Look well, though slightly injured in places by the grasshopper. *Cowley*: Good. *Osage*: Generally very fine. *Coffey*: An unusually fine crop promised.

NEBRASKA.—*Cuming*: Heavy. *Dakota*: Fine prospect, but danger of lodging from wet weather.

OREGON.—*Marion*: Look well, but must have rain soon.

THE TERRITORIES.—*Santa Fé, New Mexico*: Very promising. *Lewis and Clarke, Montana*: Very fine.

## RYE.

In all the New England and Middle States rye is above average in condition, but with a reduction of 1 to 15 per cent. in acreage, New Hampshire and Vermont being the only States in which the area of last year was sown. In North Carolina the acreage is increased 4 per cent., and the condition of the crop improved 8 per cent. In all the other Atlantic coast States the acreage shows a decline. The Gulf States report an increased acreage, with an improved condition in Texas, and a decline of 5 per cent. in Louisiana. In Arkansas, Tennessee, and Kentucky the acreage is increased from 4 to 12 per cent. Ohio reports 11 per cent. decrease in area and 7 per cent. in condition; Michigan 3 per cent. in each. Indiana reduces her area 3 per cent., but her crop is over average in condition. The other Northwestern States are average or above in condition, and also in acreage, except Missouri and Kansas, which are 12 per cent. short. Five counties in Oregon show a general increase of 2 per cent. in acreage.

RHODE ISLAND.—*Kent*: Rye greatly improved by the late warm wet weather; straw light, but the grain nearly average; spring rye very promising.

NEW YORK.—*Jefferson*: Winter rye fair. *Dutchess*: Poorly filled, but well strawed. *Queens*: Fair.

NEW JERSEY.—*Morris*: Improved by late heavy rains.

PENNSYLVANIA.—*Luzerne*: Rye that escaped winter-killing is now 10 per cent. average. *Indiana*: Improved by late rains; from fair to good. *Northumberland*: Rye double what was expected early in the spring; about half average. *Butler*: Half average. *Montgomery*: Half a crop; shortened by drought.

VIRGINIA.—*Highland*: Very poor; acreage small; poor for several years.

NORTH CAROLINA.—*Henderson*: Reduced acreage, but enhanced yield. *Bladen*: Good yield.

GEORGIA.—*Gordon*: Grain extra; crop thin. *Marion*: Acclimated rye very good.

FLORIDA.—*Bradford*: Shortened 25 per cent. by drought.

TEXAS.—*Williamson*: Crop splendid. *Medina*: Drought has reduced the crop below average.

TENNESSEE.—*Dyer*: Scotland very fine. *Roane*: Scotch rye very excellent.

KENTUCKY.—*Lincoln*: Very good. *Mercer*: Promises very well; heads long and well filled. *Spencer*: Yield 10 per cent. greater, and quality equal to last year. *Anderson*: Good. *Henry*: Crop above average.



OHIO.—*Scotio* : Remarkably good.

ILLINOIS.—*Bureau* : Was thought to be winter-killed, but has come out well. *Ogle* : More than average.

MINNESOTA.—*Sibley* : Looks well.

IOWA.—*Calhoun* : Three or four acres sown ; the first crop of the county ; looks well. *Jasper* : Never better.

MISSOURI.—*St. Louis* : Yield short, but quality better than usual. *Carter* : The Scotch rye from the Department is a failure—will not make the seed. *Macon* : Fall rye winter-killed. *Reynolds* : The Scotch rye from the Department badly damaged by the Hessian fly. *Cole* : Average.

NEBRASKA.—*Hall* : Spring rye from Germany, introduced this season, promises well. CALIFORNIA.—*Contra Costa* : Only raised by a few for German bakers ; it grows luxuriantly. *Lake* : Nearly a failure.

## BARLEY.

This crop is a full average, or above, in condition, in all the New England States, with a slightly diminished acreage. In New York and Pennsylvania it is about average, with a very considerable reduction of area. In several counties of New York the prospects of the crop are spoken of in enthusiastic terms. From some counties of Pennsylvania reports of injuries by drought have been received. In Maryland the acreage was reduced 35 per cent. New Jersey, Delaware, Virginia, South Carolina, and Florida make no returns of this crop, while in Georgia and the Gulf States it is mentioned only in one or two counties. Texas reports an increase of 14 per cent. in acreage. In Red River and Williamson Counties the condition of the crop is very superior. In Arkansas, Tennessee, and West Virginia it is cultivated to but a limited extent. In Kentucky it is more general. North of the Ohio River it is quite a common crop, but exhibits this season a considerable reduction of area in all the States except Wisconsin, where there is an increase of 4 per cent. In Ohio and Indiana the condition of the crop is below average ; but in all the other States it is above. West of the Mississippi the condition varies from average to 18 per cent. above, with a considerable reduction of area in Missouri. On the Pacific coast the condition is from 5 to 12 per cent. below average.

NEW YORK.—*Wyoming* : Barley never looked better for a full crop. *Stenben* : Very promising. *Livingston* : Looking very fine.

PENNSYLVANIA.—*Lancaster* : Short, but looks well. *Chester* : Shortened by drought.

TEXAS.—*Red River* : Fine. *Williamson* : Splendid.

OHIO.—*Miami* : Turning out better than was expected. *Scioto* : Unusually good.

INDIANA.—*Posey* : Injured by the army worm.

ILLINOIS.—*Ogle* : Promises a fine crop. *Lee* : The only fear is from lodging. *Monroe* : Winter-killed.

WISCONSIN.—*Greene* : Spring barley looking finely, but much complaint of chinch-bugs. *Lafayette* : Good. *Calumet* : Has not suffered from drought like wheat and oats. *Dane* : Good season.

MINNESOTA.—*Freeborn* : Much corn-land seeded to oats and barley, owing to wet weather in corn-planting season. *Murray* : Never looked more promising. *Steele* : Splendid. *Meeker* : Somewhat lodged, but looks finely. *Houston* : Never better.

IOWA.—*Muscatine* : Fully 10 per cent. above average condition. *Scott* : Looks fine. *Howard* : Good condition ; lodging in places. *Marion* : Attacked by the chinch. *Marshall* : Ten per cent. of my barley is blighted, but no complaint heard from others. *Plymouth* : A failure ; frozen out. *Jasper* : Never better. *Mitchell* : Seldom has promised better.

MISSOURI.—*Saint Louis* : Winter barley 30 per cent. short of last year in amount, but of better quality than usual. *Nodaway* : Will be harvested the second week in July.

KANSAS.—*Brown* : Increased acreage and splendid promise.

NEBRASKA.—*Dakota* : Good prospect. *Nemaha* : Spring barley looks well.

CALIFORNIA.—*Placer* : Both yield and quality below average. *Lake* : Nearly a failure. *Amador* : Crop average.

## POTATOES.

In the New England States the acreage in potatoes is very nearly average, and the condition above average, except in Rhode Island, in which it is 4 per cent. below. The Middle States are about average both in acreage and condition. The earlier planted appear to best advantage. The potato-beetle is reported in ten counties in Pennsylvania. In the other Atlantic and in the Gulf States as a whole, both acreage and condition are somewhat below average. In Louisiana and Texas both are above average, and all the other States of the Union the acreage is above average, except Wisconsin, which is 1 per cent. below. In condition West Virginia is 3 per cent., Ohio 7 per cent., California 2 per cent., and Oregon 7 per cent. below average. All the other States not mentioned are above average, the excess ranging from 2 to 9 per cent.

**SWEET POTATOES.**—No reports from New England, New York, Michigan, Wisconsin, and the Pacific States. The acreage of the other States is not far from average, ranging from 15 per cent. below in Florida to 15 per cent. above average in Nebraska. The general condition is considerably below average.

**MAINE.**—*Sagadahoc*: Large portions of the potatoes late planted on account of wet, but they are now growing very finely.

**VERMONT.**—*Franklin*: Rotted somewhat by heavy rains just after seeding.

**NEW YORK.**—*Wyoming*: Very promising. *Queens*: Look well.

**NEW JERSEY.**—*Mercer*: Look well; crops average; sweet potatoes affected by drought.

**PENNSYLVANIA.**—*Bucks*: An unusually large area planted in potatoes. *Berks*: Average. *Fayette*: Potato-bug appeared, but has done but little damage. *Chester*: Early planted potatoes doing well; late planted shortened by drought. *Northumberland*: Promising. *York*: Growing well and looking strong and healthy.

**MARYLAND.**—*Baltimore*: Promising a heavy yield; acreage large.

**VIRGINIA.**—*Albemarle*: Mostly eaten by bugs. *Clarke*: Destroyed by a lead-colored bug. *Prince William*: Prospect poor. *Princess Anne*: Potato crop full, but not all dug on account of low prices; the finest Early Rose commanded only 75 cents or \$1 per barrel in Norfolk. *Henrico*: Early potatoes a failure. *Highland*: Promise of good crop.

**NORTH CAROLINA.**—*Hereford*: Very promising. *Perquimans*: Potato-bugs at work.

**FLORIDA.**—*Columbia*: Sweet potatoes injured by drought. *Clay*: Increased attention to the crop. *Orange*: Drought limited the planting.

**ALABAMA.**—*Conecuh*: Irish potatoes average; sweet potatoes delayed in planting and looking badly. *Montgomery*: Sweet potatoes promising. *Pike*: Potatoes a failure, vines luxuriant but no tubers. *Clarke*: Sweet potatoes injured by drought.

**LOUISIANA.**—*East Baton Rouge*: Crop fine; 25 per cent. greater than last year. *Rapides*: Sweet potatoes backward.

**TEXAS.**—*Hardin*: Promise a heavy yield. *Cherokee*: Fine crop. *Williamson*: Abundant and excellent. *Fayette*: Yield far above average, but in many cases are rotting from having been too early dug. *Gillespie*: Second crop planted. *Upshur*: Sweet potatoes as good as last year, and earlier planted.

**WEST VIRGINIA.**—*Pleasants*: Much infested with a worm that feeds upon the leaf. *Kanawha*: Flourishing.

**KENTUCKY.**—*Fayette*: Promising. *Hopkins*: Early potatoes very fine. *Spencer*: As yet uninjured by the bug. *Anderson*: Considerably above average.

**OHIO.**—*Miami*: Suffering from drought. *Hardin*: Drought for a month past; years ago when the clearings were small and timber plenty, June freshets were common, but seldom come now. *Medina*: Look well, but it requires constant care to keep the Colorado bug in check. *Greene*: Not nearly so much injury from the Colorado bug as was anticipated. Late potatoes may be injured to some extent, but early ones have escaped. *Ottawa*: Suffering from drought. *Union*: Small from the effects of drought. *Morrow*: Generally look well, but required faithful efforts to exterminate the Colorado bug. *Delaware*: In good condition; the bug has appeared, but done no damage as yet. *Lorain*: Suffering from the inroads of the Colorado bug, especially the "Early Rose." *Huron*: Look very well, though the bugs are troublesome in some parts of the county. *Athens*: Colorado bug and drought very hard on the crop. *Columbiana*: A loss of one-third of the crop by bugs indicated.

**MICHIGAN.**—*Wayne*: What few were planted look well in spite of the bug; condi-



tion reduced 10 per cent. below average by the Colorado bug. *Van Buren*: Much injured by the Colorado bug. *Shiawassee*: The bugs are damaging the crop greatly; Paris green used with good effect. *Emmett*: Scarcity of seed caused a reduction of the acreage. *Monroe*: The bugs will destroy 20 per cent. of the crop.

INDIANA.—*Floyd*: Very promising; several thousand barrels already shipped and the ground planted in cabbage. *Switzerland*: Largest crop of early potatoes ever grown; late ones now being planted. *Clarke*: Abundant promise. *Brown*: Doing finely, and not seriously injured by the Colorado bug. *La Grange*: Bugs very numerous, but more effort taken to destroy them, and the prospect much better than last year. *Marshall*: Crop somewhat damaged by the bugs. *Stark*: Drought has injured the early potatoes. *Bartholomew*: Promise an immense crop. *White*: Suffering greatly from drought.

ILLINOIS.—*Stephenson*: Growing rapidly, and it is hoped are out of danger from the Colorado bug. *Will*: With favorable weather the crop will be large. *Bureau*: Nearly double the acreage of any former crop, and looking well in spite of the bugs, which are numerous. *Ogle*: Acreage less than last year, but condition good; fewer bugs. *Clark*: Less damage by the Colorado bug than last year. *Pike*: An increase of acreage, but the drought has prevented a correspondingly large yield. *Pope*: Less than half the crop yet planted.

WISCONSIN.—*Douglas*: Sometimes planted at the head of Lake Superior as late as July 16th and do well. *Clark*: The crop promises over an average, in spite of the destruction by the Colorado bug. *Jackson*: Probably as good as last year. *Outagamie*: The potato-bugs more numerous than ever. Last year many potatoes were planted about June 20 and escaped them, producing better than early ones. The Early Rose and Goodrich are the only kinds which can safely be planted so late.

MINNESOTA.—*Sibley*: Condition good; no trouble yet with the bug. *Ramsey*: Never looked better; few bugs. *Steele*: The crop looks well, and it is hoped that the damage from the Colorado bug will be less than for some years past. *Meeker*: Some injury done by a black bug which has lately appeared. *Nicollet*: The bug disappearing.

IOWA.—*Howard*: Growing well, but still infested with the Colorado bug. *Iowa*: Damage in some places by the bug. *Mitchell*: Look well and not so much injured by the bug as usual. *Hancock*: Look fine, and not troubled by the bug. Early Rose potatoes large enough for table use two weeks ago.

MISSOURI.—*Polk*: Seed were very scarce, and many farmers planted as late as June 25. *Cass*: Those early planted small from lack of rain in June. Late potatoes look well. *Cole*: Not so much damage from the Colorado bug as last year. *Phelps*: Rather dry lately for early potatoes, which are being dug; some trouble also from the bug, but late potatoes have escaped them so far.

KANSAS.—*Leavenworth*: Will make a crop. *Rice*: Slight local damage by grasshoppers, but look fine generally. *Cowley*: Too dry for the crop. *Labette*: Fine crop of early kinds; late varieties slightly above average. *Lincoln*: Looked well up to June 25, but some complaint since of the bug. *Coffey*: In fine condition. *Shawnee*: Good. Early Rose in market June 15.

NEBRASKA.—*Thayer*: The bugs have commenced upon them.

CALIFORNIA.—*Del Norte*: Entirely cut off by frost May 20. *Humboldt*: Looking well. *El Dorado*: The early varieties (especially the Early Rose) do well, ripening in six to nine weeks.

THE TERRITORIES.—*Morgan, Utah*: 25 per cent. destroyed by grasshoppers.

## GRASS AND PASTURES.

*Pasture*.—The New England States, except Massachusetts and Rhode Island, report pastures above average, with a general improvement during June. New York is the only Middle State in which the condition is average. Pennsylvania and New Jersey have considerably improved during the month, but Delaware has greatly declined, reporting but 56 against 73 on the 1st of June. The South Atlantic States are all below average, and the Gulf States, except Florida, are above. Arkansas and Kentucky are above average; Tennessee and West Virginia below. Ohio, Indiana, and Illinois are below average, and all the other Northwestern States, on both sides of the Mississippi, are above. California is above average and Oregon below.

*Clover*.—This crop is nearly average in the New England States, but considerably below in the Middle and Southern States, except in North Carolina, Mississippi, and Texas, which are above; Texas shows an excess of 23 per cent. In the remaining States the general condition

is somewhat below average, ranging from 88 in West Virginia to 112 in California.

*Timothy*.—The general condition of timothy is below average, except in the States immediately west of the Mississippi, which range from average to 7 per cent. above. The greatest decline is in Delaware, which is 47 per cent. below average.

MAINE.—*Franklin*: Heavy rains benefited the grass. *Penobscot*: Grass looks well. *York*: Heavy in some places; in others light. *Cumberland*: Weather fine for grass and pasture; prospect enhanced 30 per cent. since June 1. *Somerset*: Grass sown last spring has come up well; hay prospect good. *Waldo*: Grass, our principal crop, has done well this season; promises a fair crop. *Piscataquis*: Pasture looks well; grass grows finely.

NEW HAMPSHIRE.—*Rockingham*: Grass decidedly better than last year, except where winter-killed. *Hillsborough*: June very favorable to grass; hay crop would be large but for winter-killing. *Belknap*: Drought for two years has injured old hay fields; those just put down in grass look well. *Stafford*: Grass of all kinds developed wonderfully in two weeks.

VERMONT.—*Franklin*: Very fine; heavy crop of hay in most parts of the county. *Orange*: Unusual richness of pastures; heavy growth of timothy and clover. *Grand Isle*: Grass crop has become heavy since June 1. *Orleans*: Grass of rapid growth; with good weather the hay-crop will be larger than for ten years. *Caledonia*: Hay crop very heavy; heavier than for years.

MASSACHUSETTS.—*Franklin*: Grass crop has improved remarkably with wet weather; the injuries of winter are being repaired. *Worcester*: Hay, not one half a crop. *Bristol*: Grass crop has suffered from the drought. *Berkshire*: Decline of 50 per cent. of hay-crop; where meadows were top-dressed with manure last fall, the crop is good; the roots of the grass should be protected; even common earth is good; top-dressing on the increase. *Plymouth*: Early June showers gave great impulse to the hay while the dry weather succeeding was excellent for harvest.

CONNECTICUT.—*Litchfield*: Three-fourths of a crop; about equal to last year; depreciated by two years' drought; continued rains may secure a fair crop; never was less grass on the 1st of July. *New London*: Canker worm in the meadows.

NEW YORK.—*Sullivan*: New grass seeding promises well. *Chenango*: Grass growing very fast. *Wyoming*: Grasses of all kinds have greatly improved. *Cattaraugus*: Hay prospect good. *Columbia*: Pastures very light. *Otsego*: Grass and pastures very fine. *Steuben*: Hay very promising. *Queens*: Hay light but harvested in good order. *Delaware*: Grass greatly forwarded by late favorable weather. *Lewis*: Pastures, clover and timothy better than last year; quality of hay not so good. *Erie*: June favorable to grass, but meadows are very spotted. *Onondaga*: Clover heavy; new laid timothy meadows very good.

CONNECTICUT.—*Litchfield*: Hay-crop equal to last year's, which was not over three-fourths of a crop; meadows injured by two years' drought; with continued rain, may give a fair crop; never was less on the ground on the 1st of July. *New London*: Canker worm at work in the meadows.

MARYLAND.—*Baltimore*: Hay crop light; clover barely worth cutting; timothy improving. *Frederick*: Pastures burnt up. *Cecil*: Pastures very bare; hay crop short. *Queen Anne*: Clover improved by late rains, which came too late for timothy.

MICHIGAN.—*Wayne*: Clover badly winter-killed.

NEW JERSEY.—*Sussex*: Clover injured by drought; later grasses in bottom meadows are looking better. *Mercer*: Clover used up by the drought; timothy short, but improved by two days' rain. *Morris*: All sorts of grass injured by the dry weather; on low-lands grass will be more than average, but in high lands it will be very short. *Monmouth*: Injured by drought. *Gloucester*: Grass crops injured by extreme drought.

PENNSYLVANIA.—*Cumberland*: Old meadows poor; new meadows fair. *Lancaster*: Grass short, but improving with fair weather; hay crop short, but good. *Luzerne*: Timothy shortened by drought. *Berks*: Hay crop 25 per cent. below average through drought; young spring clover burned out. *Bradford*: Crop improving, but old meadows will be light. *Snyder*: Grass greatly improved. *Chester*: Suffered from lack of rain. *Clearfield*: Grew rapidly in June. *Indiana*: Promising. *Elk*: Pastures never looked better; hay shortened by severe winter weather; some old meadows light from hard frost and long winter. *Centre*: Grass poor; clover next to nothing; young clover looks well. *Northumberland*: Better than was expected; three-fourths of a crop. *Butler*: Late rains have raised grass crops to a full average. *Beaver*: Hay crop short. *Wayne*: June rains favorable to hay. *York*: Early hay crop well cured and housed. *Montgomery*: Hay half crop; clover almost a failure; pasture very poor.

VIRGINIA.—*Albemarle*: Scarcely any hay saved. *Clarke*: Pasture and clover burnt up. *Washington*: Pasture a little better than last year; clover will not pay to cut; timothy very short. *Prince William*: Grass crop nearly nothing; pastures very poor.



*Henrico*: Grass crop a failure. *Frederick*: Grass and pastures improving. *Surrey*: Clover and pastures suffered from spring drought. *Highland*: Injured by cold late spring. *Fairfax*: Unprecedented failure of grass. *Amelia*: Shortened by drought. *Louisa*: Pastures dried up. *Orange*: Grass crop a failure. *Fluvanna*: Shortened by drought. *Pulaski*: Meadows light. *Spottsylvania*: Hay crop short. *Madison*: Grass crop short; hay less than for many years. *Fauquier*: Hay a failure.

**NORTH CAROLINA.**—*Craven*: Wild grasses abundant and good; clover coming in favor; crop fine.

**SOUTH CAROLINA.**—*Newbury*: Clover abundant; culture encouraged.

**GEORGIA.**—*Murray*: Pastures dried up. *Whitefield*: Not rain enough for clover and timothy. *Macon*: Grass is dead in the pastures and, except on low lands, pastures are no better than in the dead of winter.

**ALABAMA.**—*Conecuh*: Pastures good.

**MISSISSIPPI.**—*Hancock*: No artificial pastures; natural perennial grasses not so abundant as formerly.

**TEXAS.**—*Dallas*: Experiments with timothy and clover unfavorable. *Bexar*: Prairie grass waist high. *Upshur*: Pastures better than last year. *Medina*: Drought has reduced pasture.

**ARKANSAS.**—*Washington*: Clover good; timothy average.

**TENNESSEE.**—*Rhea*: Grass has suffered from drought. *Smith*: Never had finer pastures nor finer prospects for a hay crop. *Serier*: Clover suffered from drought. *Loudon*: Pastures and meadows suffering from cold dry spring weather. *Davidson*: Clover and timothy very light.

**WEST VIRGINIA.**—*Raleigh*: Meadows and pastures injured by drought, but reviving under recent copious showers. *Marion*: Upland grass will be very light. *Braxton*: Meadows improving since recent rains, but the hay crop will be short. *Hardy*: Meadows and pastures shorter than we have ever seen. *Harrison*: Pastures and meadows very poor, but much improved by the late rain. Dry weather in April and May injured pastures and clover. Timothy and red-top meadow have improved rapidly since the recent wet weather set in, and pastures are now doing very well. *Lewis*: Condition of the hay crop much improved by recent rains. *Monongalia*: Not more than half a crop of hay. Fine weather now for pastures. *Monroe*: Grass of all kinds and pastures very fine.

**KENTUCKY.**—*Hardin*: Pastures rather short. *Fayette*: Grass of all kinds good. *Lincoln*: Pastures well set and fine. *Carroll*: Fine season for pastures. *Clinton*: Meadows and pastures in good condition.

**OHIO.**—*Medina*: Clover harvest commenced; fair crop. Seasonable rains have kept grass and pastures growing. *Vinton*: The drought of last summer injured the stand of grass, and the dry spring following will reduce the hay crop more than one-half. *Coshocton*: Hay cut short about twenty-five per cent. by drought. *Pickaway*: Meadows and pastures injured by dry weather. *Morrow*: Clover and timothy good where not pastured, but scarcity of feed in early spring obliged many to graze their hay fields. *Delaware*: Hay considerably shortened by drought in June. *Lorain*: Pastures drying up. *Huron*: Pastures short. *Athens*: Pastures and meadows extremely light.

**MICHIGAN.**—*Hillsdale*: Clover winter-killed and pastures light. *Lenawee*: Clover badly winter-killed, and pastures much shortened in consequence. *Washtenaw*: Grass light. *Calhoun*: Hay and pastures injured by the cold, dry weather of spring. *Me-costa*: Meadows and pastures much injured by a drought now prevailing. *Cass*: Hay fine, and being secured in fine condition. *Leclenaw*: If we do not have rain soon the hay will not be over half a crop. *Wayne*: Clover badly winter-killed.

**INDIANA.**—*Madison*: Pastures very short, and meadows light. *Noble*: Hay and pasture cut short by drought. *Greene*: Too dry and cool in April for timothy and meadows. *Saint Joseph*: Clover and timothy the lightest yield for years, owing to lack of rain. *Cass*: Pastures somewhat improved by light showers recently. *Whitley*: Pasture badly dried up. *Wells*: Clover injured by cut-worms. *Marion*: Meadows damaged in some places by the army-worm. *Posey*: Grass injured by the army-worm. *Bartholomew*: Meadows never before so fine. *White*: Suffering greatly for rain.

**ILLINOIS.**—*Lawrence*: Grass crop extra in spite of great destruction in some localities by the army-worm. *Bureau*: Clover much winter-killed; meadows fair; pastures unusually good. *Putnam*: Clover and timothy very much winter-killed. *Clark*: Clover was much injured by drought last fall, but the season has been unusually favorable, and a good crop will be made. Young clover especially fine. *Mercer*: Timothy promising. *Lee*: Hay short from winter-killing. Pastures light. *Winnebago*: Clover being harvested; yielding two tons per acre. *McDonough*: Meadows very fine.

**WISCONSIN.**—*Waukesha*: Hay never better. *Pierce*: Much of the clover-hay has been damaged by rain in curing, and the farmers are much disappointed in their hay crop. *Richland*: Hay harvest will soon commence, with a prospect of a good crop. *Saint Croix*: Grass and pasture remarkably good. *Green*: Grass looking well. *Calumet*: Timothy and pastures in low condition, owing to drought this year, and close feeding last.

MINNESOTA.—*Ramsey* : Grass never looked better. *Wabashaw* : Clover and timothy very light, from winter-killing and drought last year. *Fillmore* : Grass of all kinds never better.

IOWA.—*Clinton* : The hay crop will be light, because we were obliged to pasture our meadows last fall. *Cedar* : Timothy and meadows injured by drought of last year and the cut-worm. *Muscatine* : Timothy almost a failure. *Scott* : Poor show for timothy. *Floyd* : Clover suffered severely by the winter, and timothy, notwithstanding favorable weather, does not make its usual growth. Tame pastures not up to average; wild ones above it. *Henry* : Timothy and meadows badly injured by worms. *Ma-haska* : In many localities the timothy meadows have been ruined by a worm like the army-worm, which has now disappeared. *Jefferson* : The hay crop will be unusually light, owing to the depredations of the army-worm. *Madison* : Timothy much damaged by winter-killing and wire-worms. *Monona* : Little timothy grown, and that much injured by last year's drought.

MISSOURI.—*Barton* : Prairie-grass splendid. It is the only kind grown. *Lewis* : Old timothy meadows full of blue-grass; newly seeded ones looking very well. *Livingston* : Pasture and the grass in splendid condition. *Cass* : Pastures good. *Sullivan* : Old clover nearly all winter-killed; newly sown, excellent. *Phelps* : Old meadows light, but newly seeded clover and timothy have heavy growth.

CALIFORNIA.—*Tuolumne* : Hay injured by cold winds and rain in the spring. *Nevada* : Pastures dry. *El Dorado* : Clover and pastures good.

OREGON.—*Marion* : The hay-crop suffering for rain. *Lane* : Grass rather light. Meadows will not last more than three or four of our dry summers without reseeded. *Douglas* : What little hay there is, is mostly cut. *Clatsop* : Grasses generally good.

THE TERRITORIES.—*El Paso, Colorado* : Pastures splendid. *Lincoln, Dakota* : Grass looks well. *Lewis and Clarke, Montana* : Native pastures excellent.

## TOBACCO.

MASSACHUSETTS.—*Hampshire* : Tobacco suffering severely from cut-worms.

CONNECTICUT.—*Middlesex* : Favorable condition. *Hartford* : Good weather, but the cut-worms destructive.

VIRGINIA.—*Mecklenburgh* : Looks very fine. *Nelson* : Poor stand through drought. *Cumberland* : Not over half a crop. *Prince Edward* : Bad stand; much replanted. *Prince George* : Drought injured tobacco. *Amelia* : Acreage reduced on account of drought. *Pohatan* : Bad stand. *Fluvanna* : Shortened by drought. *Madison* : Shortened by drought.

NORTH CAROLINA.—*Person* : Tobacco, the principal crop of the county, looks well; area increased; planting season propitious. *Davie* : Very fine; planted early and growing well. *Alamance* : Good.

GEORGIA.—*Murray* : Drought severe on tobacco.

LOUISIANA.—*Morehouse* : Very fine; crop annually increasing.

TENNESSEE.—*Smith* : Acreage increased 25 per cent. *Robertson* : Crop in good season. *Stewart* : A fair stand.

KENTUCKY.—*Hopkins* : Acreage large and planting in good time. *Ohio* : Acreage believed to be largely in excess of former years. Some complaint of bad stand, but condition generally good. *Russell* : Increase of 50 per cent. in acreage, and condition good.

OHIO.—*Medina* : Acreage last year 199 acres; less this year. *Vinton* : Considerable ground ready for tobacco, but the crop awaits rain.

WISCONSIN.—*Green* : Transplanting late, and precarious on account of dry weather.

MISSOURI.—*Livingston* : Looks finely. *Howard* : Preparations made for a very large crop, but the hot and dry weather prevented the setting out of a large portion of the crop before July 1; still, with a late fall, a heavy crop may be made.

## HEMP AND FLAX.

VIRGINIA.—*Patrick* : Flax crop promising in northern part of the county.

KENTUCKY.—*Shelby* : Increase of 15 per cent. in the acreage of hemp—condition average. *Fayette* : Hemp very promising. *Jackson* : Increased acreage in flax, and an increase of 30 per cent. of lint and seed indicated.

OHIO.—*Miami* : Flax suffering for rain. *Morrow* : Flax is becoming quite a staple. Several thousand bushels of seed and several hundred tons of straw are produced annually. *Delaware* : Flax promises well.

INDIANA.—*Huntington* : Flax injured by cut-worms. *Randolph* : Late-sown flax burned up by drought. *Madison* : Flax badly cut by the worm. *Kosciusko* : Flax much injured by hail the latter part of May. *Wells* : Cut-worm bad.

MINNESOTA.—*Watowan* : Hemp and flax sowed for the first time, and doing well.

*Nicollet* : Flax culture increasing in the southern part of the county. Dealers offer \$12 per ton delivered, months ahead.

IOWA.—*Union* : An unusual amount of flax sown this season. *Johnson* : Flax is raised by the farmers for the seed, and the production of lint by steam mills is also rapidly increasing. Hemp is also profitable. *Marshall* : About 3,000 acres of flax sown, and it is reported in good condition. A large crop of flax growing; looks well.

MISSOURI.—*Platte* : The hemp crop very materially injured by the grub-worm. *Ralls* : Flax looks well, though the quantity grown is small.

NEBRASKA.—*Washington* : Flax is being introduced and promises well.

OREGON.—*Linn* : Great hopes were entertained of success in flax-growing, but the experience of the last two years is unfavorable. The present crop looks badly, and will probably not yield more than five bushels per acre.

## SUGAR-CANE.

FLORIDA.—*Manatee* : Stubble cane injured during the winter. *Wakulla* : Crops good. *Alachua* : Good.

ALABAMA.—*Conecuh* : Small but doing well.

LOUISIANA.—*East Baton Rouge* : Cane crop short; considerably below last year. *Rapides* : Inferior; stubble crop a failure. *Saint Mary* : Seed-cane injured by the cold winter, hence but a small area was planted; stubble backward for the same reason. *Claiborne* : Sugar-cane has been largely superseded by cotton.

TEXAS.—*Fort Bend* : Looking well.

## RICE.

SOUTH CAROLINA.—*Georgetown* : Seeded late, owing to protracted freshets; acreage about the same as last year; caterpillar ravaging the crops; the prospect not flattering.

GEORGIA.—*Glynn* : Backward; injured by rice caterpillar.

MISSISSIPPI.—*Smith* : Largely raised.

LOUISIANA.—*La Fourche* : Looks well; acreage average.

## HOPS.

NEW YORK.—*Otsego* : Hops, the leading crop of the county, much injured by winter; growing crop looks well, but the yield will be reduced. *Oneida* : Very uneven; many hills destroyed by lice last year; lice have appeared this season, but have not done much damage.

WISCONSIN.—*Portage* : There are 100 acres of hops in the county, which are looking finely. *Richland* : The grub injured some yards badly, but they are clear of weeds, and generally look well. *Adams* : An increase in acreage and condition, as compared with last year.

## FRUIT.

The prospects of the fruit-crop in different portions of the Union are quite encouraging.

*Apples*.—In New England the States are all above average, except Vermont, which is 5 per cent. below. The only case of insect ravages reported was in New London County, Connecticut, where the canker-worm was stripping the trees in some places. The highest condition, 117, is in New Hampshire.

Of the Middle States New York is 6 per cent. above average, but in some places the fruit is falling from the trees. In New Jersey the crop is 29 per cent. above average, the largest excess reported by any State in the Union. There seems as yet but slight drawback to the prospect of an abundant yield. In Gloucester County the yield will be unprecedented, if no disaster overtakes the crop. In Pennsylvania the crop is 5 per cent. above average, with some remarkable improvements in different quarters. In Lebanon County the prospect is better than for twenty years past. In Lancaster County the increase over last year will reach 50 per cent. In Bucks County all apples are doing well except "Smith's cider" apple, which is a partial failure. This variety is a spe-



cial favorite in this locality, where it is extensively cultivated. The fruit is generally excellent. Delaware reports a crop 20 per cent. above average.

In the South Atlantic and Gulf States the prospects of the apple-crop have not materially changed during the month of June. Maryland is 5 per cent. above average. In Southampton County, Virginia, the crop will be finer than last year, but not so large. Late frosts have cut down the crop in some counties. In Wise County the locusts have injured young apple orchards, depositing their eggs in the young branches. The State will reach an average crop if the conditions of growth continue favorable. North Carolina is 5 per cent. above average. Ravages of locusts are reported in two or three counties, especially in Haywood, where the blight also is destructive. In South Carolina the prospect is about the same as at the beginning of June, or 15 per cent. below average. Georgia is 12 per cent. below average, though the crop is reported fine, especially in Lumpkin County. Florida reports no apple-culture whatever, the climate being too tropical. In Alabama the crop is 4 per cent. below average; in Calhoun County the abundant bloom resulted in but a slender fruitage. In Mississippi the crop is 7 per cent., and in Louisiana 14 per cent. below average. In Texas it shows an improvement of 10 per cent. In Titus County the crop was injured by storms but the general drift of county reports indicates an increased yield and improved quality of fruit. The prospects of fruit-culture appear to be quite promising.

In Arkansas the crop is 2 per cent. above average. In Crittenden County injuries by caterpillars are reported. Tennessee reports quite favorably, the crop being 14 per cent. above average. No drawbacks from frosts or winds is reported. In West Virginia the crop is but 1 per cent. below average; in some counties it is very heavy. Kentucky is 6 per cent. above average, though in some counties blight and locusts have done some damage. In Metcalf County the crop is better than for many years.

Ohio reports 11 per cent. below average. The influence of cold weather and frosts was very injurious. The full bloom reported last month in Geauga County was blasted by cold northeast winds. In some counties the fruit is badly dropping off.

In Michigan apples are 1 per cent. above average. With favorable condition a fair crop will be realized. In Indiana the fruit is reported as falling off, through drought and other causes, reducing the crop prospects 8 per cent. below average. Noble County will raise but half the crop of last year. In Wells County the measuring-worm has injured the crop. Illinois is slightly above average—101. In Boone County the trees are injured by a small green worm. In McDonough County the bloom was in excess, but the fruit has dropped off very badly; apple bloom was also blighted in Monroe and McHenry Counties. Wisconsin reports a decline of 20 per cent. below average. A hail storm in Sheboygan County did very considerable damage to the crops.

In Minnesota the apple-culture, though young, presents quite promising results, the crops being 6 per cent. above average. In Ramsey County the trees are generally loaded. In Murray County a very large number of trees has been lately planted which have not yet come into bearing. Iowa is 6 per cent. above average. In Clinton and Allamakee heavy storms did great injury. In several counties frost caused the fruit to fall to a great extent. In Marshall County this year's planting will double the number of apple-trees. Missouri is full average, but

serious depredations are reported in different counties, which, however, are compensated by remarkably large crops of fine fruit in other counties. Kansas is 6 per cent. above average. Woodson County reports an improvement of 10 per cent. The apple-growers in all parts of the State appear to be in good spirits. In Nebraska the prospect is quite flattering, the apple crop being reported at 24 per cent. above average. In Beaver County, Utah, the apple-crop is almost a complete failure; it is supposed that this results from the destruction of the buds last year by the grasshoppers.

On the Pacific-coast the apple crop is short. California is 12 per cent. below average, though an abundant yield is reported in Contra Costa County. Late frosts are alleged as the cause of this depreciation of the crops in California, as also in Oregon.

*Peaches.*—From Maine and Vermont we have no reports of the peach-crop, which is cultivated in these States to but a limited extent. All the other New England States are above average except Massachusetts, which is 5 per cent. below, Rhode Island being 12 per cent. and Connecticut 8 per cent. above. New York is 6 per cent. and New Jersey 2 per cent. above average. Pennsylvania is 5 per cent. below. Peach-buds and even trees were winter-killed in several counties, especially Tioga, Fayette, and Elk. The superior crops in some localities are not sufficient to overcome the depreciation in others. In Delaware the crop is greatly shortened, being reported at but 50 per cent. of an average. In Maryland it is 28 per cent. short, though Baltimore County reports a good prospect of peaches, while in Washington they were never more promising. In Virginia the crop will fall 10 per cent. short of an average. In Spottsylvania County the peach is an almost total failure. In Wise the locusts have greatly injured young peach-orchards, depositing their eggs in the young and tender branches.

North Carolina is reported a full average, but the locusts' ravages are also here observable in several counties. In Madison County the young trees were largely killed. In Bladen and Onslow the fruit has extensively fallen from the trees; in Craven there is a complete failure. These deficiencies, however, are about compensated by the great abundance of the crop in other sections. In Edgecombe County the crop is the best on record, special attention having been paid to it. South Carolina is 5 per cent. and Georgia 12 per cent. below par. The Gulf States, except Texas, are all deficient, Florida being 23 per cent. below average. In some localities, however, the crop is quite promising. In Texas, while the general condition of the crop is 1 per cent. above average, in some counties the yield is especially abundant and fine. Peach-culture in this State is rapidly increasing. In Cherokee County some varieties ripened as early as June 1. In Hamilton the yield will be larger than ever before. In Titus and Medina the crop was injured materially by hail-storms.

In Arkansas the crop is 12 per cent. above average, though some local drawbacks are reported. In Crittenden County peaches were injured by late frosts. Tennessee is 14 per cent. above average, and the county reports generally very hopeful. An improvement in the quality of fruit is mentioned in several counties, no injuries from insects or weather being noted. In West Virginia the crop is 26 per cent. below average. In Raleigh County it is a total failure, except in the mountain slopes. In Nicholas and Monroe lowland peaches were generally frost-killed. Kentucky is 3 per cent. below average, yet in several localities superior crops are growing. The ravages of the locust are alleged



as the reason of the depreciation in other places. Hail-storms have also injured the crop to a limited extent.

In Ohio there will be, from present indications, but a half crop. Winter-killing of buds and trees is reported from Defiance, Franklin, and Huron Counties. In Butler, however, the trees are more uniformly loaded than in any former year. Michigan will fall 21 per cent. short of an average. Trees and buds were badly winter-killed in Washtenaw, Clinton, Lapeer, and Shiawassee Counties. From Wisconsin and Minnesota no reports of this crop have been received, the climate not being favorable to peach-culture upon a scale of any importance. Indiana is 3 per cent. below average. In Floyd County the crop is reported as "immense," but in other quarters the fruit has rotted and fallen off to a considerable extent. Illinois reports an improvement of 26 per cent. The peach has held its own better than any other fruit, in spite of insect and atmospheric injuries. Iowa is 13 per cent. in advance, though peach-blossoms were considerably damaged by heavy storms in Clinton and Allamakee Counties. Missouri is 23 per cent., Kansas 31 per cent., and Nebraska 26 per cent. above average. The peach prospects west of the Mississippi are very fine generally. In California, however, there is a decline of 37 per cent., frost-killing being alleged as the cause of depreciation in many counties in California and Oregon.

*Pears.*—The prospect for pears is good in Middlesex County, Connecticut. In Tioga County, Pennsylvania, the bloom was quite full, but late frosts have greatly shortened the crops. The pears dropped off badly in McDonough County, Illinois.

*Grapes.*—The grape-crop of New England is from 4 to 29 per cent. below average. In Kent and Washington Counties, Rhode Island, and in Middlesex County, Connecticut, the vines were extensively winter-killed. In New York the crop is 21 per cent. below average. In Wyoming County grapes look well, but in Delaware they are too late to ripen. In New Jersey the crop is 12 per cent., and in Pennsylvania 5 per cent. below average. In Bucks, Bradford, Snyder, Mifflin, Tioga, Centre, Northumberland, and Lehigh Counties the vines were largely winter-killed, especially old vines. Some of these vines are again sprouting very promisingly. Delaware is 5 per cent., Maryland 10 per cent., and Virginia 5 per cent. above average. In several counties of the latter State the grape-crop is especially fine. North Carolina is 4 per cent. and South Carolina 5 per cent. above average. From different points in these States come reports of more abundant yield and finer quality of grapes, though in some instances a tendency to rot is noticed. In Georgia the crop is 2 per cent. and in Alabama 5 per cent. above average, while Florida falls short 2 per cent. In Montgomery County, Alabama, it is remarkable that all grapes are fine except the Scuppernong. Mississippi will reach 6 per cent. above average. In Hancock County the indigenous grapes, Scuppernongs, Muscatines, &c., are very abundant. Imported varieties, such as Catawba, Isabella, Concord, &c., invariably rot about the 1st of June. In Tishomingo County grapes were never so abundant. Louisiana is 2 per cent. in advance. In East Feliciana the Scuppernong grape is superseding all others, from the fact that it is not disturbed by birds. In Morehouse Parish the grape-crop is the best since 1868. Heavy rains in June caused some varieties to rot, but a free use of sulphur was found beneficial. The black Riessling is the only grape that never showed signs of rotting. In Texas the crop is 14 per cent. above average, and in a healthy condition generally. In Austin County the White German grape is very productive and promises to be a good raisin grape.

In Arkansas the crop is 6 per cent., and in Tennessee 9 per cent., above average. In Rutherford County, Tennessee, the Catawbas show some rot, but Ives's Seedling, Concord, Hartford Prolific, and Norton's Virginia are very promising. In West Virginia, are about an average, and in Kentucky 6 per cent. above. In Ohio, Indiana, and Illinois, the crop is about average, though complaints of winter-killing come from some quarters. In Michigan, Wisconsin, Iowa, and Minnesota, there is a decline from average condition of from 2 to 15 per cent. on account of the severity of the winter. West of the Mississippi the condition of the crop improves; Missouri being 7 per cent., Kansas 10 per cent., and Nebraska 8 per cent. above average. In Daviess County, Missouri, the Concord stood the winter better than the other varieties. In Neosho County, Kansas, the rose-bug was somewhat annoying. In California the crop is 4 per cent. below par, with, however, numerous marked exceptions. In Napa County last year raisins, equal to the best Malaga, were produced from the Muscat grape, and this year the product will be much increased. In Douglas County, Oregon, the grapes were injured by early frost, but subsequently started a new growth, and, if the fall season is favorable, will produce well. In Bernalillo, New Mexico, frost entirely cut off the grapes in some localities.

*Strawberries.*—In Maine, strawberries were 9 per cent., and in Vermont 4 per cent., above average; but in all the other New England States, and in all the Middle States, except Delaware, a decline is reported, ranging from 1 to 24 per cent. In Bristol County, Massachusetts, Wilson's and Cutter's varieties are the favorites for marketing. In Kent County, Rhode Island, strawberries are always a sure crop. In Delaware the crop is 16 per cent., and in Maryland 4 per cent. above average. Along the Atlantic coast the crop declines, Virginia being 8 per cent., North Carolina 5 per cent., and South Carolina 19 per cent. below average. Georgia is 2 per cent., and Florida 8 per cent. in advance. Alabama declines 5 per cent., while Mississippi rises to a full average, and Louisiana to 15 per cent. above. Texas is a full average, and Arkansas 18 per cent. above. Tennessee declines 4 per cent., and West Virginia 9 per cent. Kentucky is 13 per cent. above average. Ohio is 16 per cent., and Michigan 7 per cent. below, while Michigan, Indiana, and Illinois are about average. The drought was injurious in several quarters north of the Ohio. West of the Mississippi, Minnesota shows an advance of 34 per cent., and Nebraska of 26 per cent. above average, while Iowa and Kansas decline 13 per cent., and Missouri 29 per cent. In California the crop is 4 per cent. below average.

Table showing the condition of the crops, &amp;c., on the 1st day of July, 1872.

States.	CORN.		WHEAT.		RYE.		OATS.	BARLEY.		PAS- TURE.	CLOVER.	TIMO- THY.	POTATOES, (Solanum tuberosum.)		POTATOES, (Batatus edulis, sweet.)	
	Average com- pared with last year.	Average con- dition July 1st.	Average con- dition of winter-wheat July 1st.	Average con- dition of spring-wheat July 1st.	Average con- dition of winter-rye July 1st.	Average con- dition of spring-rye July 1st.	Average con- dition July 1st.	Average con- dition of winter-bar- ley July 1st.	Average con- dition July 1st.	Average con- dition July 1st.	Average com- pared with last year.	Average con- dition July 1st.	Average com- pared with last year.	Average con- dition July 1st.		
Maine.....	96	96	97	108	99	103	104	102	110	94	94	98	98	104	98	104
New Hampshire.....	100	98	97	103	100	101	104	100	104	98	98	99	99	101	101	102
Vermont.....	98	101	90	104	103	102	106	105	103	102	102	106	106	103	100	103
Massachusetts.....	96	98	96	101	96	100	101	100	97	92	92	95	96	100	96	100
Rhode Island.....	95	92	95	103	95	103	103	100	106	93	103	93	95	96	100	106
Connecticut.....	94	98	94	100	95	103	106	100	106	107	107	105	100	106	100	106
New York.....	99	95	78	99	93	103	86	86	103	97	97	97	101	102	96	96
New Jersey.....	102	96	69	96	85	101	100	89	73	59	96	86	96	102	91	91
Pennsylvania.....	102	98	69	96	86	101	100	89	87	82	103	86	103	102	95	95
Delaware.....	100	92	75	87	85	95	80	87	56	55	88	53	88	83	100	86
Maryland.....	100	92	57	95	85	95	72	65	62	57	93	58	93	93	100	94
Virginia.....	100	94	99	104	104	100	74	96	78	72	98	69	98	90	101	89
North Carolina.....	98	101	112	100	104	103	103	96	101	101	101	100	101	102	98	98
South Carolina.....	102	96	103	102	100	96	90	101	89	95	95	96	93	81	96	82
Georgia.....	101	94	102	100	99	100	90	101	95	97	97	97	95	83	95	83
Florida.....	100	78	100	100	93	96	76	96	96	95	96	97	93	68	85	83
Alabama.....	103	110	116	105	105	103	94	113	104	99	99	98	98	93	100	98
Mississippi.....	101	110	108	108	108	105	98	113	106	108	108	106	108	98	101	103
Louisiana.....	108	119	145	113	113	110	92	114	109	123	123	115	110	105	106	103
Texas.....	108	110	145	113	113	110	110	114	108	123	123	115	110	105	106	103
Arkansas.....	104	95	106	112	110	106	106	103	106	106	106	98	105	104	103	101
Tennessee.....	99	100	105	110	110	103	103	103	93	93	93	90	102	106	101	100
West Virginia.....	102	95	95	95	95	95	95	91	88	88	88	85	103	97	103	96
Kentucky.....	102	103	112	104	104	104	104	101	105	105	102	102	104	107	101	102
Ohio.....	102	90	75	91	89	93	91	75	93	83	89	80	100	93	98	92
Michigan.....	110	96	81	98	97	97	106	96	96	96	89	96	106	100	99	88
Indiana.....	101	95	88	102	93	101	99	91	91	91	91	90	107	102	100	99
Illinois.....	102	99	92	104	100	100	110	93	103	106	97	100	114	109	109	102
Wisconsin.....	96	86	100	101	104	102	102	104	103	106	100	105	100	102	100	99
Minnesota.....	97	86	88	110	102	104	108	104	108	110	91	103	121	110	103	95
Iowa.....	101	88	74	108	100	105	108	101	107	105	99	95	109	103	93	95
Missouri.....	104	97	66	78	88	100	113	86	99	106	102	103	109	102	101	97
Kansas.....	128	98	60	95	88	106	107	108	108	105	104	103	117	109	114	95
Nebraska.....	120	97	71	112	100	105	111	112	118	107	111	107	110	107	115	100
California.....	101	101	120	112	102	105	113	112	88	107	112	97	103	98	98	98
Oregon.....	100	97	94	95	102	105	98	97	97	95	97	92	107	93	93	93



Table showing the condition of the crops, &amp;c.—Continued.

States.	BEANS.		SORGHUM.		SUGAR-CANE (not sorghum.)		TOBACCO.		COTTON.	WOOL.	APPLES.		GRAPES.	STRAW- BERRIES.	
	Average com- pared with last year.	Average con- dition July 1st.	Average com- pared with last year.	Average con- dition July 1st.	Average com- pared with last year.	Average con- dition July 1st.	Average com- pared with last year.	Average con- dition July 1st.	Average con- dition July 1st.	Amt of wool compared with last year.	Average com- dition July 1st.	Average con- dition July 1st.	Average con- dition July 1st.	Product com- pared with last year.	Product com- pared with last year.
Maine.....	103	101								79	108		93	109	
New Hampshire.....	101	100								98	117	101	86	87	
Vermont.....	105	102								108	95		96	104	
Massachusetts.....	98	97					108	88		97		95	75	84	
Rhode Island.....	100	101								100	110	112	83	88	
Connecticut.....	99	102					117	101		101	115	108	71	76	
New York.....	99	101								98	106	106	79	99	
New Jersey.....	102	101								94	129	102	88	94	
Pennsylvania.....	101	98					105	93		98	105	95	95	91	
Delaware.....	105	90	90	95						95	120	50	105	116	
Maryland.....	110	90	50	70			86	83		95	105	72	110	101	
Virginia.....	97	88	90	90			99	90	96	99	100	90	105	92	
North Carolina.....	100	100	54	97			108	102	94	98	105	104	104	95	
South Carolina.....	98	90	94	94					97	97	85	95	105	81	
Georgia.....	103	106	78	93	97	89	94	90	101	96	88	86	102	102	
Florida.....					94	90			102	93	77	77	98	108	
Alabama.....	114	113	80	100	102	99	105	92	106	99	96	91	105	95	
Mississippi.....	100	101	87	105	102	100	96	95	109	92	93	85	106	100	
Louisiana.....	99	100			91	93	100	100	103	123	86	115	102	100	
Texas.....	104	104	103	109	113	104	104	103	105	114	110	101	106	100	
Arkansas.....	103	95	96	99			125	103	95	116	102	112	106	118	
Tennessee.....	99	102	88	88			106	98	104	95	114	114	109	96	
West Virginia.....	101	96	88	88			103	98	101	89	106	97	106	91	
Kentucky.....	102	104	89	98			116	105	105	101	106	97	106	113	
Ohio.....	101	98	88	87			96	86		89	89	50	85	84	
Michigan.....	103	101	79	93						107	101	79	85	102	
Indiana.....	98	96	89	91			106	95		99	92	97	102	98	
Illinois.....	99	100	91	96			105	102		100	101	126	99	83	
Wisconsin.....	99	100					127	97		98	80		93	93	
Minnesota.....	103	102	91	97						119	106		96	134	
Iowa.....	100	100	94	93			105	94		102	106	113	98	87	
Missouri.....	99	100	83	95			112	96	95	101	100	133	107	71	
Kansas.....	112	102	104	97			107	99		110	106	131	108	89	
Nebraska.....	104	105	97	98						130	124	136	108	126	
California.....	91	94								111	88	63	96	96	
Oregon.....	106	91								112	81	81	94	99	

## FOREIGN CORRESPONDENCE.

The Department has occasion to congratulate itself upon the continued advantages of its extensive foreign correspondence, and the successful results of the system of international agricultural exchanges which has been established with numerous governments of this continent and other quarters of the world. The Commissioner has had the satisfaction to receive from the director of the agricultural department of the Argentine Republic at Buenos Ayres the following interesting and highly encouraging communication :

ARGENTINE REPUBLIC,  
*Buenos Ayres, April 10, 1872.*

SIR : I have the honor to state that, on the 1st of January of this year, the national agricultural department of this republic was duly installed, according to law, decreed by government on the 21st of July, 1871.

As it is of the highest importance to place itself upon intimate relations with similar institutions in other countries, and especially those which have arrived at such an advanced state in agricultural pursuits as that which I have now the honor to address; and as this country is as yet in its infancy, but abounding in agricultural wealth, which will be developed and in course of time occupy a prominent position among other countries of the world, I request the honor of mutual co-operation with the Department of Agriculture of the United States, begging that information may be sent to this department on all topics which concern the same, and which the prominent position of that institution renders of such vast importance, such as: First. New inventions of agricultural implements and machinery. Second. Discoveries with respect to the cultivation of agricultural plants, observations on growing the same, principally taking into consideration their peculiar nature and diseases. Third. Information as to the breeding of animals. Fourth. Cultivation of woods, gardening, fruit-trees, vegetables, flowers, &c., &c. Fifth. Mining, shooting, and fishing, (artificial fish-breeding,) or any other branch belonging to the agricultural department. This department will be most happy to afford in return every information concerning agriculture in this country.

The recently closed national exhibition in the city of Cordova has afforded this department an excellent opportunity to make collections of the agricultural products of this country, samples of which will be forwarded to foreign agricultural departments.

A remittance to this department of agricultural seeds, especially different varieties of wheat, barley, beans, oats, maize, cotton-seed, rice-seed, linseed, grass-seeds, &c., &c., forest plants, shrubs, and fruit-trees; also seed of same, (especially seed or plants of *Pinus gigantea*,) vegetable seed, models of agricultural implements and machinery, pictures of prize animals, pamphlets on agriculture, &c., &c., will be conferring a great favor, which will be highly esteemed by this department.

Trusting that the most friendly relations may henceforward exist between us to mutual advantage,

I remain, sir, yours, respectfully,

E. OLDENDORFF,  
*Director of the Agricultural Department.*

THE COMMISSIONER OF THE DEPARTMENT OF AGRICULTURE  
OF THE UNITED STATES, *Washington.*

In connection with its foreign correspondence, the Department is in receipt of many publications from abroad, relating to agriculture and collateral subjects. From this source much interesting and valuable information is obtained in respect to the science and practice of husbandry in its various branches, as well as to the progress of agriculture in other countries. From the Agricultural Society of the Argentine Republic, accompanying a selection of valuable tree-seeds, including the seed of the *Nandubay*, (*Acacia cavaniana*,) a tree which is highly prized for building and other purposes, the wood being exceedingly strong, and of the *Espinillo*, another variety of the acacia family, bearing an odoriferous aromatic flower, the Department has received a series of numbers of the "Annals of the Argentine Rural Society." This publication, the organ of the society, is devoted to the collection of facts connected

with husbandry, and to the encouragement and general progress of agriculture in that republic. The subjects that are embraced in its statements and discussions afford gratifying evidence of a zealous interest in the development of the natural resources and agricultural capabilities of the country. These subjects embrace forest-culture; diseases of cereals; cultivation by steam; breeding of cattle; epizootic diseases; cultivation of the grape, the eucalyptus, rice, Indian corn, tobacco, &c.; wool, and the wool-trade; and a great variety of other topics. Among them is a curious article on the sunflower, a plant in the cultivation of which, for various economical purposes, an unusual interest has recently been excited in this country. Its culture in the Argentine Republic is strongly urged from the following considerations: The flowers are said to afford bees the best material for honey and wax; the petals are regarded as valuable for dyeing purposes; the seeds yield 50 per cent. of an excellent cooking and illuminating oil, superior food for poultry, and food for cows, which increases the production of milk; the bottom of the calyx resembles the artichoke, and can be used as food in the same way; the wood yields 1 per cent. of potash, while common hard wood yields only one-tenth as much; the leaves are used as food for animals, and make a good smoking tobacco; and the bark, properly prepared, affords material for the manufacture of paper.

A model farm is to be established by the agricultural department of the Argentine Republic, which is under the direction of M. Oldendorff, at Santa Catalina, about twelve miles from Buenos Ayres. The government has determined to expend half a million dollars in forming an academy, a farming school, and a gardening school, on the model of similar institutions in other countries. The studies to be pursued are, general farming, gardening, the care of horses and poultry, botany, growth of timber, chemistry, geology, land-surveying, machinery, drawing, and modern languages. The model farm will be conducted by students, from whom no pay for instruction will be required.

The department has also been favored by Señor Garcia, the minister of the Argentine Republic, resident at Washington, with a list of American exhibitors who obtained prizes at a late national exhibition at Cordova, the capital of one of the most important states of that republic. The list embraces the names of some twenty citizens of the United States, to whom gold and silver medals, as first and second prizes, were awarded, for improved implements of agriculture—plows, reapers, scythes, irrigators, corn-scatterers, hand-pumps, and other articles.

Under date of the 9th of May, General Charles P. Stone, recently of the United States, and now general and chief of staff of His Highness the Khédive of Egypt, writes that with the rapid increase of area of cultivable lands in that country, resulting from the wise improvements of the present Khédive, there is a lack of laborers for taking full advantage of the rich soil, and that hence the attention of land-owners is turned to the introduction of good practical labor-saving machines. The Department is solicited, therefore, to furnish sketches of such machines in agriculture as are simple and strong in their construction, and do not require too much skilled labor to manage and repair them. Hints upon cotton, rice, sugar, and tobacco culture, as practiced in this country, are said by General Stone to be seized upon with avidity by the cultivators of Egypt. The chemist of the agricultural department of Egypt has for a considerable period been engaged in testing various kinds of wheat, to ascertain which is most valuable in that climate. He finds that an Algerian wheat, after eight years of trial, has not deteriorated. General Stone suggests that this wheat would be valuable in the extreme



south of the United States, and proposes to forward to the Department a parcel of seed of the new crop, just being harvested. It is sown in December, and harvested in May, and stands very successfully the climate of Egypt, in latitude  $30^{\circ}$ , where it rarely receives rain, and is grown by irrigation. General Stone has sent to the Department a pamphlet on the Indian bamboo, which is being acclimatized in Egypt with great success. This pamphlet was recently published at Cairo, under the patronage of the Khédive, by the agricultural department of Egypt. We append a few notes from it, which may serve to answer inquiries frequently made at this Department for a suitable material for lining and protecting the banks of rivers and canals; for this purpose the bamboo, which may be acclimated in this country as well as in Egypt, seems to be peculiarly adapted :

The gigantic bamboo, which is of colossal dimensions, growing to the height of 20 meters, with a circumference of 40 to 50 centimeters at the base, (say 65 feet high and 15 to 18 inches in circumference,) from the joints of which, especially those of the middle and upper parts, grow numerous branches with long leaves, is the most vigorous species of this arborescent plant. It was introduced some years ago into the gardens of the Khédive of Egypt, at Ghézireh, from whence it has been multiplied in two or three other gardens of Egypt. It was so much admired by the Emperor of Brazil, on his visit to the gardens of the Khédive last autumn, that he expressed his determination to import it into Brazil, and to cultivate it upon the imperial estates as a shade for animals during the heats of summer.

The gigantic bamboo originates in India and China, and is highly appreciated wherever it is cultivated, being used for posts in pavilions and the houses of the inhabitants. The hollow joints are utilized for carrying liquids, for flower-vases, &c.; and in China, and especially in India, for bottles and tobacco-boxes, highly wrought and polished, and sold at great prices. The larger stalks are also used for bridges, water-pipes, and carts and other vehicles. In fine, the wood is employed in the arts, in a multitude of industries, and for implements of agriculture.

This species of bamboo vegetates with such rapidity that it can almost be said that one can see it grow. Its progress may be seen from day to day, and at Ghézireh it has been known to grow 9 inches in a single night. In China, criminals condemned to death are subjected to the atrocious punishment of impalement, by means of the bamboo. A humid soil is congenial to the gigantic bamboo, although it suffers under a prolonged inundation. It is proposed in Egypt to cultivate it upon the borders of the canals in the vast domains of the Khédive.

There is also in the gardens of Egypt another species of bamboo, believed to be the *Bambusa arundinacea* of Willdenow. It presents the following characteristics: The stalks are smaller and shorter than the gigantic bamboo of India; it attains about 12 meters (39 feet) in height; it forms larger tufts or clusters than the great bamboo, and throws out a greater number of stalks, which are furnished with numerous slender and flexuous branches, bearing ordinarily tolerably large thorns, a little arched at the joints or articulations, and the leaves are smaller than those of the gigantic species, being rounded at the base, lance-shaped, tapering to a point, and a little downy.

There is another species of bamboo which it is proposed to cultivate in Egypt. It attains a height of 5 or 6 meters, produces enormous clusters of canes, about the size of the finger, and makes excellent props for use in horticulture. A plant of two or three years' growth will furnish a hundred stalks, forming a cluster of vast size. This species is the *Bambusa edulis*, so called from the fact that its young shoots are edible, and in China regarded as very nourishing.

There is still another species of bamboo to which the attention of the cultivators in Egypt is called. It is the black bamboo, (*Bambusa nigra*.) It is distinguished principally by its slender branches, which are of a fine black color, and from which canes are manufactured extensively for exportation. Pens are made from the smaller stems, which are commonly used for writing in Egypt.

The opening of direct communication by rail from New York to San Francisco, and by steamship thence to New South Wales, has so shortened distance that our buyers of Australian wools, instead of going to England for supplies, may go direct to the first market. This has induced the Agricultural Society of that colony to send to R. W. Forbes & Co., of New York, thirty-three prize fleeces, which were exhibited in the exhibition in Sydney in 1871, "in order,"

as stated by Mr. Joubert, secretary of the Agricultural Society of New South Wales, "to enable not only the buyers of wool, but also the breeders of sheep, to see what we produce; and with a view to bring about an exchange which must necessarily prove of mutual benefit." These fleeces were designed for the New York Chamber of Commerce, but as that body has no suitable room for their exhibition, they have been sent to this Department, where they may be examined at any time in connection with the descriptive catalogues which accompany them. The subject of a system of exchanges of wools and of breeds is thus proposed by Mr. Joubert:

The council desires me to say that they are most anxious to enter into regular communication with your Department, with a view of establishing an exchange of blood in sheep, cattle, &c., &c. I need not say that we shall place anything coming from you before our members, and obtain the greatest possible notoriety for your products \* \* \* We hold a metropolitan exhibition once a year, and it has been our wish to obtain exhibits from the States; hitherto we have had but few, and principally implements.

As the Department has no means wherewith to establish a system of exchanges of animals, it can only refer the proposition to individuals and associations for their action. In this connection the following letter from Mr. Randall, president of the National Wool-Growers' Association, is worthy of consideration:

CORTLAND VILLAGE, NEW YORK,  
March 25, 1872.

DEAR SIR: While I think it would be discourteous to decline a system of exchanges of domestic animals with the Agricultural Society of New South Wales, I confess I cannot, at present, see how it can be rendered successful. I am inclined to think our importers of choice horses and cattle and coarse-wool sheep would prefer to look for them in England, and it would not pay to import any but very choice animals from Australia. Owners of these would not be likely to wish to export them on uncertainties, and without knowing distinctly what they were to receive in return.

In regard to fine-wool sheep, apparently the most favorable subjects of exchange, the standards of breeding in the two countries are essentially different. A friend of mine brought out from Australia some merinos, six or eight, and placed them with me. They were from the most celebrated flocks, and were mostly first-prize sheep at the Australian International Colonial Show. They were of good size and form, and were very hardy and vigorous. Their wool was much finer than ours, and more than proportionably lighter. Compared with ours, they were a thin-wooled sheep. Their fleeces would not sell for enough more per pound than American merino fleeces to be as profitable as the latter.

Hundreds of American breeders of full-bloods saw them on my farm, and not one of them would have taken the sheep as a gift. I ceased to breed them separately, and not being willing to use the rams, they became extinct, with the exception of one prize ewe of the original importation, which I now have.

Our breeders, who grow finer sheep than the American merino, generally prefer certain German stocks, which give heavier fleeces than the Australian; and though their wool is not so fine as the latter, it is as fine as any demanded, to any extent, in our markets. The truth is, very fine merino wool never fetches enough more than that of medium fineness to make up for the difference in weight of fleece.

Mr. Joubert wrote you that the American merinos heretofore exported to Australia were not liked there. Their sheep proved equally unsatisfactory here. I cannot, therefore, see much, if any, prospect of a satisfactory or useful exchange.

I am, sir, very respectfully,

HENRY S. RANDALL.

Hon. FREDERICK WATTS,  
*Commissioner of Agriculture.*

Among the recent foreign publications received at the Department is the "Bulletin of the Royal Society for the Protection of Animals in Belgium," which contains views worthy of attention and adoption. The protection of animals against the cruelties of human avarice has an economical as well as a moral importance, and may well claim the aid of



national legislation. The penal code of Belgium inflicts fines and imprisonment upon persons guilty of maltreating animals or of exposing them to torture in public spectacles and fights. The society above referred to is designed to promote the merciful treatment of animals; to co-operate with the laws which aim at that end; to encourage such publications as are calculated to further the object; and by all practicable methods to enforce the law which, in that respect, ought to rule in every man's heart. It aims likewise to check the needless cruelties which too often attend the slaughtering of animals, and even extends its beneficent guardianship to the protection of such birds as the interests of agriculture require should be preserved from the snare of the fowler. The bulletin furnishes information also as to the operations of other foreign societies for the protection of animals. At the International Exposition of Agriculture to be held at the Hague in September next, by the Agricultural Society of Holland, premiums, with a view to the more comfortable working and compassionate treatment of animals, are to be offered for the most approved railway car for the transportation of cattle; for the best descriptions of harnesses for plowing, for draught, for the tow-path upon canals, and for ordinary carriages; for improvements in head-stalls, bits, halters, sheep-shears, methods of transporting poultry, &c.; and also for treatises on horse-shoeing, slaughtering animals, and insectivorous birds. A society at Lyons has offered a premium of 200 francs for the best treatise on the origin and causes of cruelty to animals, and the most natural and effectual remedies. A society exists at Hamburg which is distinguished by its active and intelligent efforts. It numbers 1,250 members, and extends its operations to the giving of horse-blankets to hackmen and others who are unable to purchase them, and to the distribution of rewards among those who are especially careful of their horses, and premiums for meritorious acts of solicitude for animals, as well as to the detection and prosecution of cases of cruelty.

The colonial secretary of the island of Trinidad, in response to a letter of the Department, writes, that the government of that island will be happy to co-operate with the Department of Agriculture in Washington in effecting a mutual interchange of plants and seeds indigenous to the respective countries, and that the government botanist has been directed to prepare such seeds and plants as this Department may desire to possess.

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## TEA-CULTURE IN JAPAN.

The Department of Agriculture is indebted to the Secretary of the Navy for the following very interesting report upon the culture and preparation for the market of tea in the Suruga district, Japan, made by Master J. E. Pillsbury, in command of the United States steamship *Emperor*, and transmitted to the Navy Department by Rear-Admiral Jenkins, of the Asiatic fleet. The *Emperor* was detailed to convey Mr. C. O. Shepard, chargé d'affaires, and a party of several other gentlemen, including two Japanese officials, from Shimidze, Japan, to the tea district; and Master Pillsbury made the observations which are detailed in his report in company with this party, under the guidance of a merchant of Skidzaoka, from whom much valuable information was obtained.



SIR: \* \* \* \* \*

The tea district of this province (Suruga) is about twenty miles nearly west from Shimidze. A tea merchant from Shidzaoka, (a city about ten miles from the bay,) who receives his tea from many plantations in the neighborhood, was our guide, and took great pains to give us all the information in his power. The tea of this province, which is said to be among the best of any in Japan, amounts yearly to twenty thousand piculs, nearly one-sixth of the whole production. The seeds are planted in December and grow during the first year two or three inches. On the third year, a light crop may be picked, which goes on increasing until the ninth or tenth year, when it is largest and has the best of flavor. The full life of the tree is from twenty to thirty years, and when it has reached this age it is cut down to the stump. Shoots spring up again, and in three or four years are ready for picking. This second life of the tree is much better than the first, both in flavor and size of production; but after it has run out they are obliged to dig it up and replant the seeds.

Nearly all the small farmers owning but little land raise grain enough for home use, and among the wheat, buckwheat, rice, &c., plant the tea-trees. The regular growers, however, have their plantations separate, and almost entirely on hill-sides, which are sometimes so steep that it would seem almost impossible to ascend. They are four or five acres in extent, the trees planted quite regularly, and four or five feet apart. The soil, which may be quite ordinary, is manured with fish, or bean-cake, but only sparingly.

When the tree is in its prime it looks like a very angular apple-tree reduced in height to four or five feet. Of all the branches of more than a year's growth but very few run in the same straight line more than a few inches, but turn in every possible direction in sharp angles. The probable cause of this angularity is the continued picking and twisting it has in its smaller and more tender branches as they pick its leaf. The leaf in its full size is about one inch and a half in length, with a very fine serrated edge, quite firm, and has a slightly waxy appearance. Its veins are very few and but slightly visible, except when looking toward a strong light. Until they are nearly the full size they are a very light green, turning as they become old a dark green, and quite stiff.

The picking-party, composed of women and older children, start to the field early in the morning, carrying several square bamboo baskets holding about two bushels, and smaller round ones to sling to the waist of each picker. They work systematically, up one row and down the next, one or two at each bush, picking with great rapidity the light-green leaves and as little of the stem as possible. As soon as the small basket is filled it is emptied into the larger ones, which are carried to the farm-house as fast as they are ready. There are two pickings during the year—the first about the 1st of May, and the last by the 1st of August. Sometimes there are intermediate ones when the demand is great, but it produces very inferior tea, as recourse must be had to the dark, stiff leaves. The first picking is always the best, and the earlier it is the better, for then the leaves are younger. The average crop of the regular pickings from one tree is 13 pounds per year.

At the farm-house the men remain to prepare the leaves. They first put about a bushel at a time into a shallow bamboo basket, over boiling water, and cover up, to steam. They remain here from 45 to 70 seconds, become very soft and pliable, and only require to have the superfluous water evaporated from them to be ready for the next process.

The next operation is to fire them. The firing-pans are made of a frame of wood about 54 by 36 by 4½ inches, with a very thick paper bottom. This tray is placed on a fire-place built of mud and lime, in which is a charcoal fire, having a temperature at the paper bottom of about 140°. On the top of the fire-place or oven is a grating of flat iron to keep the bottom of the tray from coming through. The green leaves are put in the tray to the depth of about two inches, and kept moving by the hands to prevent them from sticking together. As they begin to dry and change color to a dirty brown, the man takes his hands full and rolls them to assist in the curling. This is continued from 60 to 90 minutes, when the leaf is of a brown-black color, and rather dry. They are then taken out, allowed to cool, and all the imperfectly rolled ones and bare stems picked out. They are again put back into the firing-pans to finish drying and get an additional curl. It is now nearly black, and is ready to be packed in paper bags to be sent to the native tea-merchant. One man must prepare 10 catties, or 13½ pounds, per day to earn his wages; in doing this he expends 40 catties, or 50-odd pounds, of the green leaf, 75 per cent. being lost in firing.

After leaving the tea district we went to the city of Shidzaoka to visit the establishment of the merchant who had been our guide. There, after slightly warming the tea, as received from the country, in the same kind of pans, it is put through bamboo sieves, for the purpose of assorting the grades; the finer kinds only are marketable to foreigners, and the coarser leaves are put into inferior tea for native use. After sifting

they are put into fring-pans and kept in motion for about twenty minutes. It changes color to a greenish tinge and has a fine aromatic odor.

The last operation is to fan the dust out. About two or three pounds are placed in a bamboo vessel shaped like a coal-shovel, having a square edge on one side and high curved sides on the other three. The man who holds it tosses the tea up and at the same time forces the sides together, making the bottom quite concave. As the tea falls, he extends the sides, thus allowing the bottom to spring back to its natural position, and making it act as a fan to produce a current of air under the tea. As all the dust falls, sinking below the large leaves, it is brought into contact with this air, and so blown out on the floor. It is then boxed up and sent to the European merchant.

The preparation of tea for use would not be complete without a description of the operation it goes through with in the hands of the foreign merchant. The tea, as received from the native merchant, after being weighed is thrown into a large bin, from which it is measured out to the fring-girls. Instead of the wood and paper trays they have iron bowls about two feet in diameter, encased in long masonry ovens, with a place for the charcoal fire under each one. The tea in them (over a heat of about 175°) is kept continually moving to insure equal heating. Experts move about while the firing is going on, and when it has reached the proper point, direct it to be removed. It is then a grayish-green color, perfectly dry, and has an improved flavor, but being very brittle, is considerably broken up. It is then sifted to exclude the dust, packed in leaded cases, covered with mats, and is ready to be shipped. The entire loss in weight, from the time the leaf is picked until it reaches the consumer, is about 80 per cent.; from which we see that the small province of Suruga alone produces yearly about 100,000 piculs, or over 13,000,000 pounds, of the green leaf.

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## INDUSTRIAL EXPOSITIONS.

UNIVERSAL EXHIBITION AT VIENNA, IN 1873.—An exhibition of unusual magnitude and importance is to be held at Vienna during the coming year, under the patronage of the Emperor of Austria. It is designed to afford a complete representation of the present state of civilization and the entire sphere of national economy. An act of Congress, passed at the last session, authorized the President to appoint one or more agents to represent the Government of the United States at this international exposition, provided that such appointments shall not impose on this Government any liability for the expense they may occasion. In accordance with this act the President has appointed Mr. THOMAS B. VAN BUREN to be commissioner on the part of our Government. Mr. Van Buren has an office at 51 Chambers street, New York, where exhibitors may obtain any desired information concerning the exposition. The exhibition will be held in the Imperial Præter, a place admirably adapted to give it the best effect by affording the amplest facilities for the display of the contemplated vast collection of the arts and industries of universal civilization. The Præter is an immense park, some five or six miles in length, traversed by six noble avenues of chestnut-trees, running in different directions, the principal one being 15,000 feet in length. It is divided into three parts, one for horsemen, one for pedestrians, and the other a broad road for carriages. Nothing of the kind in the world, perhaps, exceeds this grand promenade and drive. It is the customary place of resort for the citizens of Vienna on Sundays and holidays, and on ordinary occasions it presents the appearance of a great fair. It is characteristic of the gay and hospitable people of Vienna, and gives full scope to their proverbial love of harmless amusements.

Agriculture, horticulture, forestry, and industries of every description, including the arts of war as well as of peace, and the fine arts, will be embraced in the objects to be exhibited. An attempt will be



made to give an epitome of the history of inventions, by competitive trials of machinery, apparatus, and methods of work of different dates ; in addition to which the productions of machines and hand-work will be placed side by side, to show that while in some cases machines have superseded hand-work, in others they have aided and increased its products. A representation of the commerce and trade of the world will be given by exhibiting specimens of the articles of trade at all the important sea-ports, each specimen being marked with the origin, destination, price, and quantity of import and export of the article. There is hardly anything, however remotely connected with agriculture and the industrial arts, that will not be embraced in the comprehensive programme of this universal exhibition; and the whole will be accompanied by international congresses and conferences for discussing important matters, and special lectures and experiments, such as will subject machinery and various scientific theories to practical tests. The exhibition will be diversified, and its staid character of utility relieved, by representations of all kinds of sports, including the inevitable race, regattas, and national games and plays; and exhibitors will have an opportunity to dispose of their alimentary substances in tasting-pavilions and refreshment-rooms erected for the purpose.

The exhibition includes some novelties or features which are not common to such occasions, and which, if carried out to their full extent, will be of valuable as well as of curious interest. Among these are plans for affording different nations an opportunity to illustrate their peculiar forms and actual conditions of domestic life, by presenting models of the inner arrangement, furniture, and decorations of their private dwelling-houses, and also the arrangements, furniture, and utensils of their farm-houses. The object is to show how the private dwelling-house can and ought to be built in order best to fulfill its purpose, taking into consideration the climate and local circumstances, and the mode of life, wants, and habits of different peoples. The practical value of such an exhibition will be, that it will furnish opportunities for instructive comparison of different styles of domestic architecture, and for recommending that which may be best suited to particular climates and habits of life—economy, taste, and comfort being taken equally into account. The farm-house exhibition is well calculated to attract the peasantry, and to arouse their special interest. The generally unsuitable condition of farm-houses constitutes a good objective reason for the proposed international display, with a view to such comparison as will excite attention and stimulate to improvement.

**AGRICULTURAL EXPOSITION AT BARCELONA, SPAIN.**—An agricultural and industrial exhibition of implements of husbandry, with particular reference to those connected with the culture of the vine and the olive, and the fabrication of their products, is to be opened in September next at Barcelona, the capital of the principality of Catalonia, in Spain, commanding one of the most fertile and best cultivated plains in the Peninsula, and famous for the manufacture of wines and brandy. Competition will be free to all nations, and the Spanish government has arranged to admit models free of duty and at reduced rates of transportation. Implements and machines sent for exhibition will, if desired, be submitted to practical tests as to their capacity, efficiency, and economy of operation. Besides being rich in wines, Catalonia has extensive manufactories of cotton, silk, lace, and glass.



## JAPANESE PAPER.

The manufacture of paper is one of the most remarkable of the native industries of Japan. An account, recently obtained through the British consuls at Kanagawa, Nagasaki, and Osaka, contains many interesting facts, both as to the extent to which the manufacture is carried and the raw material from which, in almost endless variety, the article is made. No nation in the world, perhaps, has displayed greater ingenuity, skill, and patient industry in adapting paper to so many useful as well as ornamental purposes. Inquiries submitted to the Department in respect to this manufacture have induced a brief statement of the facts of which it is in possession. These facts, by no means as full as could be desired, in an agricultural point of view, are not without value as indicating the practicability of cultivating, in the varied climate of our own country, those productions which have supplied the Japanese with such economical materials for the manufacture of paper.

The paper-mulberry, (*Makódzu*.) the Kaji tree or shrub, and the Makaso and other plants, are cultivated in Japan for the manufacture of paper. The paper-mulberry has been thus used for two hundred and fifty years. From a very ancient date, and up to the year A. D. 280, or thereabouts, silk, with a facing of linen, was used in Japan for writing upon, as were thin wood-shavings. In that year paper was imported from the Corea, and no other paper than that appears to have been known in Japan till about the year 600, when the manufacture was introduced by a priest from Corea, who had probably learned the art from the Chinese. A son of the then reigning Mikado learned of this priest how to make paper. That first made, of whatever material, lacked strength and durability, easily became worm-eaten, and did not take the ink well. The Mikado's son first used successfully in the manufacture the mulberry, which, hence, came to be called the paper-mulberry; he also caused it to be planted throughout the country, and the mode of making paper from it to be extensively promulgated.

The paper-mulberry is cut down to the root annually for four years; in the fifth year, it becomes a dense shrub from six to ten feet high, when the shoots, or stalks, are cut, steamed, the bark stripped off, dried, and prepared for making paper. This is done by washing and boiling the bark, and pounding it with clubs into the requisite pulpy state. The paper is set or formed in frames, or sieves of bamboo, by dexterous manipulation, somewhat after the old method in this country of making paper by hand, in sheets, the size of which was regulated by the frame or mold. The young wood is preferred for paper material, and the inner and whiter bark of the youngest branches is selected for the better qualities of paper.

The kaji tree, also used extensively for paper-making, is a shrub which grows in all parts of Japan, and is cultivated in the same manner as the mulberry. The plant is said to resemble our willow, and like that thrives well near water. There seems to be no reason why it and the paper-mulberry should not flourish in this country, and it is supposed that paper can be manufactured from the bark of either at a cheaper rate than from any equally good material which we now use. The paper-mulberry has indeed been cultivated in the grounds of the Department of Agriculture with the same success which has attended the introduction of the Chinese mulberry; so that the capabilities of the milder climates of our country for its growth may be considered as having been demonstrated.

The makaso and several other plants used for making paper are cultivated in the same manner, and manufactured by the same general process as the mulberry, the manipulations varying only with the classes and qualities of the paper produced. The kinds of paper that are made are almost innumerable, some of them possessing extraordinary qualities, and the purposes for which they are used are surprisingly various, embracing the most delicate as well as the roughest objects, and involving ingenious processes and great skill and dexterity in their manufacture. Paper is made in imitation of leather and of water-proof cloth, and possesses all their qualities. This is done by an admixture of a paste or glutinous substance which is produced by boiling fern and other roots, adding a juice expressed from unripe persimmons. It is dyed of different colors, and is a very tough and strong material, perfectly impervious to water, and capable of resisting intense heat. It is used for boxes, trays, and similar purposes, and even for saucepans, which sustain no injury over a hot charcoal fire. Prepared with oil, it is used for rain-coats, and as a substitute for glass in windows. Water-proof great coats, made of this species of paper, may be purchased for about 35 cents a piece, and they are completely impervious in a storm of rain, although very light. The Japanese persimmon, which seems to be an essential element of this description of paper, is in process of successful culture in the gardens of the Department of Agriculture. It does not differ in its constituents from that which is indigenous to the southern portions of this country; but it is much larger and altogether of a superior quality, and its successful culture in this country, which may be regarded as assured, is a matter therefore of commercial as well as agricultural importance.

The Japanese are wonderfully proficient in giving to paper great hardness and weight, as well as extreme delicacy, lightness, and beauty of texture. It is impossible to tear the tougher sorts of paper across the grain, and thin strips, torn in the opposite direction, make tough and convenient strings.

The inquiries in respect to Japanese paper which have been addressed to this Department have exclusive reference to its commercial aspect, and to the question of its importation. It is obvious, however, that the papers of Japan, various and beautiful and valuable as some of them are, could not be utilized in this country and made available as an article of merchandise for the reason that they are adapted only to the peculiar tastes and customs of the Japanese themselves. The consular reports referred to contain enumerations of various kinds of paper manufactured in Japan, known by distinctive names, and extending to a hundred and fifty different classes. Besides the uses previously specified, different sorts of paper are manufactured expressly for the making of hats, coats, shoes, bags, umbrellas, handkerchiefs, fans, screens, wall-decorations, candle-wicks, mats, toys, trays, boxes of all kinds, purses, pocket-books, tobacco-pouches, ornaments of every description, hair-strings and pins, female hair-ornaments, bank-notes, drawing, painting, and numerous other purposes, including diplomatic, ceremonial, and fanciful descriptions for official dispatches, letters of congratulation, and other communications exchanged on festive occasions.

The handkerchiefs made of paper, and commonly used by the Japanese, are of a whitish-brown color. Until a recent period, the Japanese were in blissful ignorance of the comfort of a cotton handkerchief, which is now an article of extensive exportation to this country and England. Among the many varieties of the Japanese fan is one which is employed in the battle-field as an arm of defense. It is made of paper, and is of larger size than usual, the sheath being of iron, so that, if fatigued by a



violent personal encounter, a warrior sits down a moment to rest and cool himself, and is unexpectedly attacked, he immediately hits his enemy over the head with his fan. These fans are only made to order, and are adorned with the national emblem—a red sun on a black ground. The fan is an inseparable part of the Japanese dress; and in strong contrast with those above mentioned, is a fan also made of paper, so thin and transparent that nothing can be conceived lighter or pleasanter to use. In the museum of the Department of Agriculture is a specimen of the beautiful transparent paper which is used for making such fans and other articles of extreme nicety and delicacy. The varieties of the paper fan of the Japanese would form a very curious collection in respect to form as well as quality. A Japanese is rarely without a fan. It is his shelter from the sun, his note-book, and his plaything. Without it he is as much at a loss as an American would be in unaccustomed company without a walking-stick, or something wherewith to occupy his hands.

## EXPERIMENTS WITH CORN.

Very favorable reports have been received by the Department of experiments with "Cooley corn," distributed during the winter of 1871-'72. Among these may be noted the trial made by Mr. A. J. Wright, of Port Gibson, Claiborne County, Mississippi. Mr. Wright says:

The Cooley corn received from the Department was planted March 8 and March 25, on land of moderate strength, with a slight broadcasting of ashes, plaster, and superphosphate. It yielded an abundance of choice roasting-ears by the 10th of June, proving about as early as the earliest garden varieties. The ears were of good size and handsome, and the yield very heavy, many stalks bearing three and in some cases four ears. Planted nearly a month after the "Peabody Prolific," it was in roasting-ear ten or twelve days in advance of that variety. We had some fine varieties of corn from Kansas, and some of the kinds usually planted here, but the "Cooley" was superior to any of them, except the "Peabody," concerning my experiment with which I submit a memorandum.

Mr. Wright states that he planted small quantities of corn received from Mr. Charles A. Peabody, of Augusta, Georgia, on the 10th and 30th February of the present year. It was in roasting-ear about June 25, giving an unusual yield, although not cultivated with any considerable care. Suckers shoot from the base to the number of two, three, and sometimes four, growing, in rich land, nearly to the size of the parent stalk, and bearing ears, so that there is sometimes a product of nine or ten ears to the single grain. The growth is very vigorous, yielding a large amount of fodder. It is thought by Mr. Wright that, with proper cultivation, it might yield on Mississippi fields as high as one hundred bushels per acre.

Cooley corn has succeeded well in Florida. Mr. J. D. Wolfe, of Pensacola, says that he marketed his product two weeks in advance of all other corn, and that for early maturity and productiveness it is unrivaled in that section. On one-sixth of an acre, although the season was unfavorable, he raised one hundred and ten dozen ears of good size, which netted in market \$24.75, or at the rate of \$148.50 per acre. Mr. W. planted his corn at different times, with reference to having roasting-ears, until the frosts in November. Having planted peas between the rows, he would have, in addition to his corn and pea product, corn-fodder and forage at the rate of two tons to the acre, the ground being cleared in time for a crop of turnips, ready for the market in January.



## TREE-PLANTING FOR PROFIT IN THE MIDDLE STATES.

It has been shown by the result of actual experiments that timber-growing on the prairies and plains of the West is a profitable enterprise. Its profit has not been so clearly demonstrated in the Middle States, a country of natural forests, where neglected fields are constantly undergoing transformation from tillage lands to woodlands. Where the forests have been cleared, and population is dense, there is still an abundant and cheap supply of coal in the latter States; and though coal is abundant west of the Mississippi, the opened mines are at such a distance that corn is often used for fuel, and the planting of rapidly-growing trees becomes a necessity, and its practice is already proving a success. The question of the profit of similar enterprises on the Atlantic coast is an interesting one, which has occupied the attention of many practical minds. The following communication from a correspondent, Mr. Wm. C. Lodge, of Claymont, Delaware, presents facts and suggestions pertinent to this subject:

Though few experiments, and those generally on a small scale, have been made in timber-planting in this section, we yet have specimen plantations of all ages, from those but recently made to the towering groves of sixty years' growth, comprising all varieties of timber and cord-wood trees, showing the relative growth and value for mechanical purposes of the different trees common to this climate, and demonstrating the fact that larger trees and more valuable timber can be produced by culture than can be obtained from natural forests of equal age. Another advantage in artificial forests is the control of the varieties, which is, of itself, a matter of such importance as to render the artificial products more than double the value of the natural.

It is a well-known fact that the durability of timber depends upon the quality of soil in which it grows, the climate, and the age of the tree. As a rule, the strongest and most durable timber, particularly hardwood, is grown in a temperate climate, and in a clay or "white-oak" soil. While all varieties of the oak grown in high latitudes are comparatively soft and brittle, the same kinds grown between the thirty-sixth and forty-first degrees of latitude are more compact in texture, stronger, and more durable. The white oaks of Pennsylvania, Delaware, and Northern Virginia furnish timber for mills, ships, and other purposes where great strength and durability are required, almost equal to the live-oak of the South. A competent inspector will at once determine the locality in which the specimen submitted to his examination was grown, and tell whether it grew in a clay or sandy soil.

With the hints furnished by nature as our guide, we began the business of planting forest-trees. Our operations extend through a period of forty years, and our design, originally, was to utilize waste places, such as hill-sides difficult of culture, rocky fields, irredeemable swamps, as well as sterile or exhausted sand-beds. At the same time we planted a portion of our lands best adapted to general agricultural purposes, in all cases charging the crops with the cost of labor bestowed, the interest on the value of the land, and crediting it only with the products actually realized or carefully estimated.

We aimed to select such trees as were adapted to the soil and the situation. On our fertile "bottom-land" we planted the tulip-poplar for its clean, rapid growth, the white oak for its timber value, and the chestnut and honey-loust on account of their quick growth and durability as fence posts, railroad ties, and the latter especially for tre-nails, or trunnels for vessels. We also planted the black walnut and some other trees for their ornamental woods. It is needless to say that the best lands gave the most satisfactory results, and, with one exception, the largest clear profits.

The white willow plantation gave the largest returns for the capital and labor invested; but this was owing to the local demand for its wood by the extensive powder-works of the Messrs. DuPont, in the immediate vicinity.

The best or "bottom-lands" were planted after a previous corn crop with young trees taken from a nursery, two years old. The trees were planted in the intersections of the markings, leaving space for two rows of corn both ways between the rows of trees. The number of trees to the acre was somewhat over three hundred. Corn was planted between the trees annually until it ceased to be remunerative or interfered with their growth. This occurred in the fourth or fifth year. Thereafter the soil was once plowed and harrowed annually for about three years, when further care was

abandoned, except an occasional pruning or cutting away of such inferior trees as interfered with the growth of others more valuable.

The rocky fields and the hill-sides that did not admit of culture by horse-power were grubbed, spaded, and afterward planted, partly with young trees two years old, and partly with nuts and seeds. Most of the nuts either failed to vegetate or were eaten by mice and squirrels, and necessitated replanting with young trees. To these rough plantations we did not give much after-culture, but applied guano and wood-ashes to the soil, which produced a rapid and healthy growth in the young trees. Wood-ashes have, with us, proved the best fertilizer for young trees. We consider an application of leached wood-ashes almost indispensable for a young plantation of forest-trees unless the soil is already well charged with the elements of fertility.

The white-willow plantation was made on low, moist ground, partly in a swamp. Large slips or stakes about six feet in length are cut from the trees in March and April, sharpened at the large end, and driven a foot or eighteen inches into the yielding soil, or inserted in holes made with a crowbar. No further care is necessary until after the fifth year, when the branches may all be cut for the powder-mills, leaving a single main-stem about six feet in height. This stump immediately throws out a system of branches that may again be cut after a period of five to seven years. Periodical cuttings may thereafter be made every five years, which seem to invigorate the tree, and tend to form a crown, from which an increased number of branches spring forth.

The locust requires a deep, rich soil to produce the best results. It will bear cultivation in close thickets, and may be cut periodically every sixteen years. Our single half acre is a profitable portion of our forest plantation. The trees, two years old, were planted in good soil after a previous crop of corn, seven feet apart each way, with a row of potatoes between. They were cultivated one way for four successive seasons, when we ceased to plant the potatoes, and left the trees to take care of themselves.

The chestnuts were planted with the locusts, the same distance apart, and in the same manner, except that the nuts were planted instead of young trees. Once started, the after-treatment was the same as the locust plantation. Each are cut at intervals of about sixteen years, and the plantations thicken and increase greatly in value with every periodical cutting. Our chestnut and locust plantations have quadrupled in value after the two cuttings they have received. Three to six sprouts spring from every stump, each making a growth quite as vigorous and as much wood in the same time as did the parent tree.

The soil in which all our deciduous trees are planted is chiefly clay, or clay with a slight intermixture of loam. A sandy soil is more suitable for the pine, and even the barren sand-hills, occasionally found on the shores of the Delaware and Chesapeake Bays and along the Atlantic, may be utilized by the pine, and made to pay a fair profit on the timber product.

On a tract of sandy land, almost devoid of vegetable growth, in the county of Somerset, Maryland, is one of the most successful experiments in pine planting. The land had previously been in "common," in order to allow it to recuperate its exhausted energies by a period of rest. It was plowed, wood-ashes at the rate of twenty-five bushels to the acre spread over it, and the pine-seed was sown broadcast and brushed in. The whole business of planting and the care of the young trees is now finished, and we patiently wait ten, fourteen, or sixteen years for the crop. A better system of planting, and one that now generally prevails, is to strike out the ground and cross-mark as for corn, four feet apart, drop the seeds in the intersections and cover by hoe or plow. The young trees may thus be regularly cultivated, when they make a straight, rapid growth. It is estimated that a fine grove, carefully cultivated in this manner for a few seasons, will be as valuable in ten years from planting as that sown broadcast will be in sixteen years. Instances are not rare of plantations of pine in the better soils near the headwaters of the tributaries of the Delaware and Chesapeake Bays, after a growth of eighteen or twenty years, making sufficient cord-wood to cover the whole ground on which it grew, to a height of two and a half feet, or, in four feet ranks, leaving passages between the ranks three feet in width.

A recapitulation, showing the costs and profits of our timber-plantation, will, we believe, demonstrate the fact that timber-planting for profit may be successfully practiced in our best land in the Middle States.

Our first plantation of oaks, poplars, &c., made on our best arable land, is yet standing, and its value can, therefore, only be estimated. The corn for the five successive years after planting the trees paid the cost of the young trees, as well as the cultivation during that time. We shall only charge the trees with interest on first cost of the land and the taxes for forty years.

On a measured acre we have 112 white oaks, worth, standing, \$8 each.....	\$896 00
Eighty tulip poplars, \$10 each.....	800 00
Eighty-two walnuts and other trees, worth \$6 each.....	492 00

Total value .....	2,188 00
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Deduct interest on cost, \$60 per acre .....	\$144 00
Taxes for forty years, \$2 per acre.....	80 00
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	\$224 00
Leaves clear profit for forty years .....	1,964 00

From one-half acre of locusts we cut in sixteen years—

111 railroad ties, 30 cents each .....	\$33 30
131 fence-posts, 22 cents each .....	28 82
In thirty-two years, or next sixteen years, 387 railroad ties, 30 cents .....	116 10
10 cords of firewood, valued at \$3 per cord .....	30 00
Estimated value of standing stock .....	150 00

Total products of half acre .....	358 22
Deduct interest and taxes forty years .....	112 00

Clear profits .....	<hr/> 246 22 <hr/>
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The willow-plantation netted, gross, per acre, for the seven different cuttings that were made, the aggregate, \$3,763, being the most profitable of any part of the plantation.

The plantation of pines on the comparatively cheap sandy land in Maryland, worth \$20 per acre, cut from twenty to twenty-five cords of wood in fourteen years after planting the seed, valued at \$7 per cord delivered at the railroad station. This wood is chiefly used for railroad and steamboat purposes, and is always in demand.

The value of the wood product is not the only consideration in the pine crop. The pine growth is a remarkable renovator of the soil. Comparatively valueless for agricultural purposes at the time of planting, the land is found to be in a high condition of fertility on the removal of the wood. From fifty to seventy-five bushels of corn per acre is frequently grown among the stumps with necessarily imperfect tillage.

Our most successful vineyards and peach-orchards follow a growth of pine. In the county of Sussex in Delaware, near the Atlantic sea-board, and in the counties of Kent and Talbot in Maryland, near the Chesapeake, are several of the finest vineyards in the whole country; and peach-trees attain a great age, and bear annual crops in these counties when they follow a growth of pine. Neither the curculio stings the young stoned fruit, nor does the borer injure the roots of the trees planted where pine recently stood. The plum, apricot, and nectarine succeed as well as the peach, so long as the land is "new," and although their exemption from injury by insects is, by some, attributed to the salt atmosphere wafted from ocean and bay, we are satisfied, by a course of experiments, that the chief benefit is derived from the resinous odors of the pine, for which the insects entertain a decided aversion.

It is not easy to draw a comparison between the profits of general agriculture and those of timber-planting, inasmuch as the former are realized annually, but the latter at long intervals. We have kept an accurate account with our farm for the whole period of our timber-planting, from which we present in the aggregate the following figures, running through a period of forty years:

CR. by—

6 crops of wheat, average 22 bushels per acre, price average, \$1.25 per bushel ..	\$165 00
6 crops of corn, average 48 bushels per acre, price average, 60 cents per bushel ..	172 80
12 crops of hay, average 1½ tons per acre, price average, \$17 per ton .....	225 00
16 years' pasturage, at \$7 per acre .....	112 00

Forty years' total value farm products .....	674 80
From which deduct interest on cost of land, \$60 .....	\$144 00
Taxed for 40 years at \$2 per acre .....	80 00
	<hr/>
	224 00

Leaving, without counting cost of labor and fertilizers .....	450 80
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We have, therefore, the average timber products per acre for forty years...	\$2,058 00
Average agricultural products per acre for forty years .....	450 80

Making the timber crop more than *four times as valuable* as the cereal and grass crops for the same period, and leaving the land in a more healthy condition for orcharding and general cropping.

In the above comparison of the respective profits of forest culture and the ordinary products of agriculture, no allowance is made for compound interest upon the receipts of the farm during the forty years of forest growth, an item of considerable importance in the calculation.



## ALFALFA IN CALIFORNIA.

The alfalfa, or Chili clover, (the lucerne of Europe, *Medicago sativa*,) is a plant of great importance to California. It appears to luxuriate in the climate and soil of the southern portion of the Pacific coast, pushing its tap-root to an extraordinary depth, and defying the effects of the severest drought. In response to a request from this office, Mr. N. Wyckoff, of Woodland, Yolo County, California, gives the results of his experience and observation as follows:—

In the winter of 1854 I sowed four acres with some seed brought from Chili, and, so far as I know, it was part of the first parcel of seed introduced into this State. Mine, with that of many others who sowed that season, proved to be so very foul with mustard and kale, that after two years' effort to eradicate the pest I became disgusted and plowed it up. However, it gave evidence of being a desirable grass by its remaining green and growing through the whole dry season, and even in the warmer part of our winter, and by the fondness that the cattle evinced for it—they keeping it grazed close to the ground. Some clusters of that sowing which escaped the plow (for it has a very tough and wiry root, extending many feet into the ground,) are still alive, and compare favorably with the sowing of ten years later, and justify its German name of "everlasting clover."

In the winter of 1864 and 1865 I renewed my efforts, obtaining good, clean seed, and sowed twenty-five acres. The plowing had been done well, and early in the winter—two months before the time of sowing, which was about the middle of March—using ten pounds of seed to the acre. This proved to be light sowing; but it was fortunate for me, as it yields more and better seed when thin, thereby leading me to make the raising of seed a specialty. From this parcel of land I have gathered seed and sold to parties in nearly all the coast and valley counties of this State. From all I have received good reports.

From eight acres of this sowing, in 1869, I cut two crops for hay and one for seed, the first and third for hay. It yielded over five tons of seed, nearly 1,300 pounds per acre, and was sold for 25 cents per pound.

Its yield in some seasons is truly beyond credence. In 1870 I estimated the yield to be ten tons to the acre, and grazed the fields from the 5th of November to the 1st of April. In this county (Yolo) some have cut five crops during one summer. This was upon the Sacramento River, where the soil is a warm, light alluvial.

From Santa Barbara County I have advices that six and seven crops have been cut during one season; but there it is warm, and grows through the whole year.

Some cut when the growth has attained a height of two feet, without reference to its age or maturity. I am of the opinion that it ought to have a greater age to be of the highest excellence. My rule is to let it continue the blooming for ten days or more; it is then less washy and far better for horses than if cut earlier. For milch cows it is good at any age. Its quality as a hay for all purposes ranks below that of the wild or native oats of this country. The oats-hay we deem as good as the timothy of the Atlantic States; but alfalfa, grown upon the plains here, is better than any other clover I have ever had any experience with. For cattle, sheep, hogs, (when grazing or fed upon the hay,) and all stock not doing hard work it is superior.

Soil that is good for wheat and barley I find is good for alfalfa, but it especially delights in a warm, sandy loam. All alluvials are good. The class of lands upon which it is doing well around me, range from the first-named above to the adobe.

There is great advantage in fallowing for this crop. The time to plow is late in the winter or early in the spring, before the rains have entirely ceased. By thus exposing the soil to the sun during our long summer, all vegetation is destroyed; it should then be put in fine tilth by the plow, harrow, and roller, (if needed.) During September or October the seed may be sown and lightly brushed or rolled, but not harrowed after sowing, as the seed germinates well only on or near the surface. From 15 to 20 pounds are sown to the acre. Sowing at that time, if the rains come early and sufficient, it obtains a growth before the cold weather to withstand any frosts that we usually have here. But the best time to sow, for most seasons here, is the month of February or early in March. Thus, the ground having been deeply plowed early in the winter, then replowed or cultivated in February, or put in fine tilth—sow as above, 15 or 20 pounds to the acre, roll or brush, as the condition of the ground would indicate, and success usually follows. When the rains are well over for the season, say the 1st of June, or as soon as the growth is sufficient and the ground firm enough to prevent injury by trampling, let it be grazed closely, as it seems to improve it for a greater yield the second summer.

We do not usually cut anything from it the first season, pasturing it only; but on

the Sacramento River lands parties have cut two crops the first season, and it certainly can be done in some localities, when sown in the fall before the rains commence, and then followed by a warm winter.

With regard to making seed, I have letters from individuals living in the coast counties of this State, which inform me that within the fog belt, (a distance from the coast of 25 or 30 miles,) alfalfa does not make much seed, for the reason that the moist atmosphere induces a continuous growth of the stock, which thereby lodges badly. They speak of it as blooming, but the seed-forms do not fill. When sown thick it does not seed well here, but makes better hay and much better pasturage.

All the foregoing applies especially to California, and I may be asked whether, in my opinion, it would grow and do well in any of the Atlantic or Gulf States. I am fully of the opinion that it will do very well in any of the Southern States. In Mississippi and Louisiana, where I lived many years ago, I have the utmost confidence that it will do as well as here for grazing or soiling purposes; but as it would make a heavy growth, and as it cures slowly, it might be difficult to save it as hay in a climate where rain falls during the summer months.

I am satisfied that upon all the river bottoms and the cane-uplands it would take most readily, and yield in feed many times that of any grass cultivated there twenty years ago. It would have all the qualities of the Bermuda grass, which prevents washing off of the soil on the hill-lands, and a yield of feed astonishingly greater. I have sent small parcels of seed for trial to Tennessee, Illinois, Ohio, and Maryland, one each. From the latter only have I received any report. Richard Deaner, living near Keedysville, writes that it grew finely during the past summer, but that the frosts had cut it down to the ground. So I have seen it here; but the cold weather over, and a few days of warm sunshine, the fields are green again. My fields were cut down by frost last December, but now (February 10) the growth is one foot in height.

It has one grave fault, common, however, to all clover with which I have had anything to do; that is, when growing very rapidly, if cattle fill themselves with it quickly it gives them the *hoove*, or colic. This, probably, is caused by the rapid generation of gas in the rumen. I have not known it to affect other stock than cattle and sheep, and the latter in but few instances. When grazed closely it has no bad effect on any stock, not even that which other clovers have in some seasons of the year, viz., salivation. I have not seen the least sign of it in my experience.

You may have seen from the many notices in the California papers that it is becoming one of the prominent interests with the farmers here. The quotations of prices, wholesale, of seed in San Francisco, as may be seen in the papers, are from 15 to 17 cents per pound. My whole crop of seed is exhausted, before the season for sowing. I estimate that there will be over 10,000 acres sown in California this year.

## AGRICULTURAL EXPERIMENTAL STATIONS.\*

The utterances of Professor Liebig in 1840 created a general conviction that chemistry must become the basis of agriculture. From general science a sufficiently thorough and active furtherance of agricultural chemistry could not be expected; special institutions appeared necessary, in which chemical inquiries, with experiments in garden, field, and stable, could be connected with observations on vegetation and feeding, not on a small scale only, but also on large agricultural fields. The question of manures was the starting-point of scientific investigation, but this has now become secondary. "After chemical investigation, with its exact evidence, had found a secure foothold in the sphere of the nutrition of plants, it extended its efforts in a remarkably short time to an analysis of the soil, of animal and vegetable life, and of agricultural technic."<sup>†</sup>

In Germany the existing agricultural colleges took up the question of agricultural chemistry, and teachers like Stœckhardt, Sprengel, and Keckerlin, and others, attained early success in the experimental field. All these agricultural institutions in Prussia were furnished with gar-

\* Prepared at the request of the Commissioner of Agriculture, by A. W. Angerer.

<sup>†</sup> Quotation from "The soil and agricultural condition of Prussia," page 547, article on Agricultural Experimental Stations, by Dr. A. Meitzen; Berlin, 1871.



dens and fields, chemical and physical laboratories, and carried out zealously the objects of experimental stations.

The first of these experimental institutions was established in England in 1842 by Mr. Lawes, on his estate of Rothamstead, and this served as a pattern for similar ones in Germany. The following list comprises the agricultural experimental stations in Europe at the present time:

*Agricultural chemical experimental stations in Europe.*

Number.	Name of station.	In what country.	When founded.	Name of director.
1	Rothamstead .....	England .....	1842	Dr. Gilbert.
2	Mockern .....	Saxony, kingdom .....	1851	Dr. Kuehn.
3	Chemnitz .....	do .....	1853	Dr. W. Wolff.
4	Halle .....	Prussia, (province of Saxony) .....	1854	Professor Dr. Stohmann.
5	Prague .....	Austria .....	1855	Professor Dr. Hoffmann.
6	Bonn .....	Prussia, (Rhine province) .....	1856	Dr. Karmradt.
7	Dahme .....	Prussia, (Brandenburg) .....	1857	Professor Dr. Hedriegl.
8	Pommritz .....	Saxony, kingdom .....	1857	Dr. Heiden.
9	Ida Marienhütte .....	Prussia, (Silesia) .....	1857	Dr. Bretschneider.
10	Heidau .....	Hesse, (electorate) .....	1857	Dr. Dietrich.
11	Weende .....	Hanover .....	1857	Professor Dr. Henneberg.
12	Intersburg .....	Prussia, (province) .....	1858	Dr. Habedank.
13	Carlsruhe .....	Baden .....	1859	Dr. Meszler.
14	Stockholm .....	Sweden .....	1861	Professor Dr. Müller.
15	Ultuna .....	do .....	1861	Professor Dr. Bergstrand.
16	Kuschen .....	Prussia, (Possen) .....	1862	Dr. Peters.
17	Brunswick .....	Brunswick .....	1862	Dr. Schultze.
18	Jena .....	Saxe-Weimar .....	1862	Professor Dr. Reichardt.
19	Dresden .....	Saxony, kingdom .....	1862	Dr. Hofmeister.
20	Regenwalde .....	Prussia, (Pomerania) .....	1863	Professor Dr. Birner.
21	Liebwerd .....	Austria .....	1864	Professor Dr. v. Gohren.
22	Munich .....	Bavaria .....	1865	Dr. Volland.
23	Hohenheim .....	Württemberg .....	1865	Professor Dr. E. Wolff.
24	Koethen .....	Anhalt .....	1865	Dr. Heidepriem.
25	Salzmünde .....	Prussia, (Saxony) .....	1865	Dr. Grouven.
26	Memmingen .....	Bavaria .....	1865	Dr. Hirzel.
27	Lobositz .....	Austria .....	1865	Dr. Hanamann.
28	Bayreuth .....	Bavaria .....	1866	Dr. Spies.
29	Wiesbaden .....	Hesse-Nassau .....	1868	Professor Dr. Neubann.
30	Prilex .....	Austria .....	1868	Dr. Kohlrausch.
31	De la Malgrange .....	France .....	1868	Dr. Grandeau.
32	Vienna .....	Austria .....	1869	
33	Florence .....	Italy .....	1870	
34	Turin .....	do .....	1870	Connected with the Museum of Industry.
35	Gemblaux .....	Belgium .....	1871	The first in this country, and in connection with agricultural colleges.
36	Eldena .....	Prussia, (Pomerania) .....		Dr. Trommes, Dr. Scholz.
37	Poppelsdorf .....	Prussia, (Rhine province) .....		Dr. Ritthausen.
38	Berlin .....	Prussia, (agricultural institute) .....		Dr. Eichhorn.
39	Halle .....	Prussia, Saxony) .....		Professor Dr. Kuchn, Dr. Lehde.
40	Görlitz .....	Prussia, (Silesia) .....		Agricultural Association, Mr. Peck.
41	Göttingen, (agricultural institute) .....	Prussia, (Hanover) .....		Dr. W. Wicke.
42	Altumschen .....	Hesse-Nassau .....		Dr. Dietrich.
43	Cappeln, (agricultural col'ge.) .....	Schleswig-Holstein .....		Dr. Pieper.

The work of these stations is by no means exclusively theoretical. Practical purposes had called for their establishment and have demanded their continuance. The station of Halle controls 8 deposits of manures, and makes several hundred analyses every year. The station at Bonn superintends 34 deposits and manure factories; that at Dahme controls 2 deposits. Ida Marienhütte manages a superphosphate factory and the manufacture of sulphuric acid. All stations perform technical and chemical tests in the interests of farmers, such as analysis of soil, &c., to a great extent, and derive therefrom a part of the means for their maintenance. Among the tasks undertaken are various examinations of soil; the physiology of plants and animals; the chemical and physical prop-



erties of arable land; the component parts of well-water; observations on the temperature of the soil; amount of carbonic acid in the atmosphere of stables; experiments with manures; planting of various seeds; raising of plants in pots with water and quartz-sand, different salts, and combinations of nitrogen; experiments on the nourishment of grasses through river-water; duration of life and degree of hardness of injurious plants; influence of various methods in drilling; causes of the potato-disease and its antidotes; inquiries into the nutrition of animals, the manner and measure of respiration, and the influence of various kinds of feed; experiments in fattening; inquiries into the process of life in trichines, worms, &c.; experiments in breeding, &c.

In Prussia the control over experimental stations is vested in a "central commission for experiments in agricultural chemistry," the present chairman of which is Dr. Von Nathusius, privy high councillor of state, president of the state agricultural board, and assistant to the minister of agriculture. One of its members is Mr. Von Salviati, privy councillor of state, secretary of the state agricultural board, and editor of the "Annals of Agriculture" for the Prussian states. Dr. Luedersdorff, Dr. Eichhorn, and Dr. Pringsheim complete the committee, which is under the direct jurisdiction of the minister of agriculture.

The officers in charge of the various experimental stations report to this central commission, and are subject to its direction in regard to investigations to be made in the interest of the state. Thus a number of stations are engaged in the analysis of imported manures, (guano, &c.) which of late have been much adulterated, the design of the government being to prevent dealers from imposing on farmers in this article of trade.\* The results of experiments are communicated to the central commission, to which they serve as bases for reports to the minister of agriculture, and are published in the official annals of that department. The following are illustrations of some of the titles of these reports: "Report of the central commission for agriculture (chemical experiments) on the inquiries by agricultural academies and experimental stations into the usefulness of kali preparations as manures." "Report of the central commission, &c., on experiments made by agricultural academies and experimental stations in the cultivation of poppy, for the purpose of obtaining opium." "Report of the central commission, &c., to the minister of agriculture on the labors of the experimental stations in 1869 and 1870."

The experimental stations of Prussia show the following receipts for the year 1870:

	From the state.	From agri- cultural as- sociations.	From pri- vate sources.	All other sources.	Total.
	Thaler.	Thaler.	Thaler.	Thaler.	Thaler.
Halle.....	1,200	.....	.....	4,520	5,720
Regenwalde.....	1,600	580	.....	150	2,330
Bonn.....	800	842	.....	400	2,042
Kuschen.....	1,050	328	.....	140	1,518
Insternburg.....	900	350	.....	62	1,312
Ida Marienhütte.....	1,100	300	.....	1,807	3,207
Dahme.....	3,025	450	150	300	3,925
Weende.....	1,400	1,875	.....	58	3,333
Altmorschen.....	1,300	123	258	150	1,831
Wiesbaden.....	1,800	.....	.....	249	2,049
Proskan.....	†	.....	.....	2,642	.....
Poppelsdorf.....	†2,410	.....	.....	.....	.....

\* That this trade is very considerable is shown by the fact that in 1869 Germany imported, through the port of Hamburg alone, 92,305 tons of guano, phosphates, &c.

† Paid from college fund.

The ordinary expenditures for agricultural objects by the Prussian state, exclusive of cost of administration, salaries, and construction of buildings, has been for the following purposes alone :

	Estimates.								
	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.
For general scientific purposes.	<i>Thaler.</i> 45, 495	<i>Thaler.</i> 41, 257	<i>Thaler.</i> 43, 867	<i>Thaler.</i> 44, 162	<i>Thaler.</i> 44, 277	<i>Thaler.</i> 42, 493	<i>Thaler.</i> 92, 225	<i>Thaler.</i> 103, 619	<i>Thaler.</i> 150, 180
Agricultural academies*...	53, 809	55, 539	32, 905	34, 349	34, 051	39, 261	45, 408	60, 603	69, 314
Other agricultural institutions.*	.....	.....	22, 340	22, 639	20, 358	18, 460	35, 903	40, 343	56, 200
Special purposes.....	6, 299	6, 049	5, 799	5, 799	5, 799	8, 171	15, 006	17, 329	28, 309
Premiums, (horse-raising) ..	23, 060	24, 200	24, 200	23, 615	22, 131	30, 016	61, 143	64, 604	102, 238
Total.....	123, 663	127, 045	129, 111	130, 564	126, 616	138, 401	249, 685	286, 498	406, 241

According to the report on the work of the experimental stations during the year 1870, Eldena made experiments with 13 kinds of wheat, 6 of rye, 9 of barley, 15 of oats, 7 of clover and grasses, 11 of turnips, and 14 of beet-roots. At Proskau experiments were made in planting potatoes after the system of Gulich; at Poppelsdorf inquiries into the proteine substances of barley, buckwheat, ryes, &c., were continued. At Halle they experimented in fattening with twelve sheep to compare the effect of rapeseed-cake and of lupines, and examined the process of nutrition in milk-producing animals. Among other subjects of inquiry at the experimental stations of Prussia may be mentioned the calcination of trichines; the transfer of the French disease from cattle to rabbits; the wool production of common races of sheep; the breeding of such races among themselves and with negretti; trials to prevent potatoe disease by petroleum; comparative methods of raising hops; cultivation of wheat after the Lois Weedon system; the influence of salt kali on the vegetation of the beet-root; the absorbtion of albumen in the process of digestion in ruminating animals; the variations of temperature at various depths of the soil; comparative experiments with potash, sulphate of magnesia, gypsum, &c., on plots in clover and grass, &c., &c.

Most of the experimental stations owe their existence to the agricultural associations; the one at Insterburg was established by the Central Association for Litthauen; that of Kuschen by the combined efforts of the agricultural associations of two districts; the Pomeranian Agricultural Society founded the station at Regenwalde, and an association of farmers of various districts established the experimental station at Dahme. The excellent experimental station at Ida Marienhütte, near Saaran, belongs to the Agricultural Central Association of Silesia, and is administered by a special board of trustees; those of Halle and Bonn also have been founded by the local agricultural associations.

In the Kingdom of Saxony the chemical physiological experimental station of the agricultural institute in the university of Leipzig is munificently provided with apparatus and materials for demonstrations of all kinds. Great opportunities for investigation are offered by the extensive laboratories and collections of the University of Jena to the chemical experimental station connected with the same. There is also, since 1840, in the vicinity of Jena an experimental and model farm, conducted by Mr. Sturm, the renter of the estate.

\* From a table appended to the July and August number of the Prussian Annals of Agriculture it appears that the state contributed in 1870 to twenty-seven agricultural academies and schools alone, exclusive of colleges, from which have graduated since their existence 5,865 scholars, (4,701 Prussians and 1,164 foreigners,) 38,428 thalers. To these schools belong 16,293½ morgen land for farming and experimental purposes.



The arrangements for agricultural experiments in *Bavaria* are at present subject to a re-organization, which has for its principal aim to separate the various classes of work, according as they require more scientific research or more practical experimenting, and to make distinct gradations in the character of experimental stations.

In order to satisfy the requirements of science as well as of practice, the whole matter will be directed by a commission consisting of representatives of science, such as Liebig, Voit, Nageli, Lehmann, and of intelligent landowners. For the whole of *Bavaria* only one station will be provided with all scientific means and materials; it is to be established in *Munich* as the central experimental station, and shall devote its investigations to scientific researches in the interest of agriculture exclusively. Professor Lehmann is engaged in its organization.

For experiments in a practical direction the Central-Agricultural Academy at *Weihenstephan* has been selected. This has a very large area and great stocks of cattle, and this affords opportunity for extensive experiments in manures and feed. Moreover, the trustees of the six agricultural schools in *Bavaria* have placed at the disposal of the committee fields and manures for use in experimenting with special reference to the various influences of climate and soil on farm products. Teachers of real and trade schools in the state, having a laboratory at their service, shall be intrusted with work involving the solution of agricultural problems, and receive instruction from the central experimental station in *Munich*. It is intended in this way to direct the whole experiments, scientific and practical, by the central experimental station at the capital.

In the Kingdom of *Württemberg* an agricultural chemical experimental station has been attached to the Royal Agricultural Academy at *Hohenheim*, near *Stuttgart*, since 1865. It has its own separate buildings, chemical laboratory, experimental stables, hot-houses, and fields. The state contributes annually 3,500 florins, (\$1,435.) Its director is Dr. Wolff; assistant director, Dr. Funke; station chemist, Dr. Kreuzhage; second chemist, Dr. Fleischer.

The grand duchy of *Baden* founded at *Carlsruhe*, in 1859, a chemical experimental station, which is under Dr. Nessler, with two assistant chemists.

The experimental station at *Weisbaden* in *Hesse-Nassau* is chiefly devoted to the interest of grape culture. Among the investigations made in this institution are, examination of grapes during the period of ripening; comparative examinations into the weight and analytical properties of phosphoric acid; comparative examinations of the method to determine tartar and acetic acid in wines; a full microscopic and chemical analysis of *Ahr* wines, by request of the agricultural society of *Rhenish Prussia*; the quantitative analysis of tanning substances in oak-bark; analysis of seventy different German, French, and Austrian red wines.

The agricultural chemical experimental station at *Vienna* has recently published its programme, which contains an abstract of its statutes, instructions for the control of manures, and the tariff for various analyses.

The agricultural experimental station in *Italy*, established, by royal decree of April 8, 1871, in *Turin*, has also published its programme. It purposes to make analyses of soil, of water, and of manures in regard to vegetation; to examine and test agricultural machines and tools, and to publish the results. It will render an annual report to the minister of agriculture. Pupils may be admitted, some free, (receiving from the state 200 lire per year,) and others paying 160 lire or \$32 per annum.



Belgium established its first experimental station at Gembloux, toward the close of 1871.

Every one of the agricultural experimental stations is under the direction of, or provided with, experts in chemical science. Many of the results of their investigations are published in the different states, in the official organs of agriculture, and the periodicals of agricultural associations. There is also a large literature in this field. A very interesting report of the Central Commission of Prussia, on inquiries into the disease and growth of potatoes by the experimental stations, is found in the *Annals of Agriculture*, No. 1, 1871. The "Composition and nutritive value of pasture-grass" is the subject of another valuable article in No. 2 (February and March) of the same. A report on "Trials regarding the porosity of building materials, and the natural and artificial change of air, especially in stables," by the experimental station at Halle, is found in Nos. 10 and 11. The annual report of the central commission of Prussia for experiments in agricultural chemistry, (No. 9 (September) of the Prussian annals,) gives detailed accounts of the finances and working of these institutions in 1870.

**AGRICULTURAL ASSOCIATIONS IN GERMANY.**—Agricultural associations are organized in Germany in almost all agricultural districts; they generally combine into a common central association, of which there is one, and in some cases more than one, in a province. Other associations are independent. The local agricultural published organs, and the experimental stations established by agricultural associations, are under management of the central associations.

I. Prussia in 1868 and 1871.

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Provinces.	Associations in 1868.				Members in 1868.			Finances in 1868.		Annual receipts, exclusive of state contributions, in 1868.								Associations which furnished no report.				Associations in 1870-71.							
	Total.	Central or provincial.	District or branch.	Independent.	Honorary members.	Paying members.	Total.	Capital.	Debt.	Fees of admission.	Regular contributions from members.	Extraordinary contributions or assessments.	Interest of capital or rent of land.	From city or communal funds.	From fire and other associations.	From various other sources.	Total.	Thalers.	Thalers.	Thalers.	Thalers.	Thalers.	Thalers.	Thalers.	Thalers.	Thalers.	Thalers.	Thalers.	
1. Prussia.....	118	3	95	20	355	4,950	5,305	Thalers. 25,305	428	119	9,217	403	1,319	Thalers. 4	60	3,280	14,202	6	3	94	23	120	3	94	23	120	3	94	23
2. Posen.....	32	2	21	9	27	2,173	2,200	„ 8,824	.....	10	3,753	218	364	180	.....	1,508	6,315	3	2	32	9	43	3	32	9	43	3	32	9
3. Pomerania.....	38	3	32	3	89	2,195	2,284	„ 4,500	4,000	19	5,404	.....	161	.....	1,328	403	7,315	3	3	31	4	37	3	31	4	37	3	31	4
4. Brandenburg.....	67	1	54	12	265	6,067	6,332	„ 46,763	35	254	16,066	876	2,681	542	1,353	21,044	42,276	2	3	50	25	78	2	50	25	78	2	50	25
5. Silesia.....	81	1	54	26	301	8,544	9,045	„ 122,123	1,500	289	19,473	1,667	3,904	110	.....	8,662	31,105	3	1	49	49	89	3	49	49	89	3	49	49
6. Saxony.....	83	1	66	16	332	8,019	8,351	„ 17,557	251	171	7,792	397	714	20	4,563	2,718	14,285	3	1	71	16	88	3	71	16	88	3	71	16
7. Westphalia.....	58	5	40	13	1,118	13,791	14,909	„ 28,586	2,771	120	11,756	64	1,066	875	3,011	2,716	19,608	1	5	43	37	85	1	43	37	85	1	43	37
8. Rhine provinces.....	87	1	60	26	558	22,795	23,653	„ 17,424	1,602	52	41,798	1,038	1,264	680	3,215	13,199	61,246	4	1	61	23	85	4	61	23	85	4	61	23
9. Hohenzollern.....	5	1	4	.....	.....	1,772	1,772	„ 1,424	.....	25	538	.....	116	128	73	101	951	.....	1	4	.....	5	.....	1	4	.....	1	4	.....
10. Hanover.....	163	9	130	24	543	23,751	24,294	„ 43,632	1,542	154	21,102	492	1,140	1,819	6,274	3,325	36,306	1	10	135	28	173	1	135	28	173	1	135	28
11. Hesse-Nassau.....	44	2	35	7	523	6,158	6,681	„ 21,959	6,240	234	7,682	384	644	6,477	1,142	7,692	24,255	.....	2	37	7	46	.....	37	7	46	.....	37	7
12. Schleswig-Holstein.....	43	1	28	14	199	4,971	5,170	„ 13,567	530	71	6,006	.....	524	42	.....	762	7,405	4	1	35	15	51	4	35	15	51	4	35	15
Total.....	819	31	618	170	4,810	105,186	109,996	Thalers. 353,674	18,899	3,548	150,557	5,539	13,099	10,877	21,349	63,300	268,299	30	32	642	236	910	30	642	236	910	30	642	236
Of which belong to central associations.....	649	31	618	.....	3,537	81,678	85,225	„ 276,319	14,626	931	94,876	1,017	9,834	3,473	20,893	14,471	145,525	17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Independent.....	170	.....	.....	170	1,253	23,508	24,761	„ 77,355	4,273	2,617	55,711	4,492	3,265	7,404	456	48,829	122,774	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, 1868.....	819	31	618	170	4,810	105,186	109,996	Thalers. 353,674	18,899	3,548	150,557	5,539	13,099	10,877	21,349	63,300	268,299	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

II. *The present German Empire.*

	Central Associations.	Branch Associations and others.	Total.
Prussia .....	32	878	910
Kingdom of Saxony.....	5	354	359
Grand Duchy of Oldenburg .....	5	29	34
Duchy of Brunswick.....	2	10	12
Grand Duchy of Mecklenburg-Schwerin .....	1	26	27
Grand Duchy of Mecklenburg-Strelitz .....	..	4	4
Duchy of Lauenburg.....	1	..	1
Grand Duchy Saxe-Weimar-Eisenach .....	6	69	75
Duchy Saxe-Coburg-Gotha.....	4	15	19
Duchy Saxe-Meiningen-Hildburghausen.....	11	35	46
Duchy Saxe-Altenburg.....	..	8	8
Duchy Anhalt.....	1	8	9
Principality of Lippe.....	1	2	3
Principality of Schwarzburg-Rudolstadt .....	..	11	11
Principality of Schwarzburg-Sondershausen .. ..	..	6	6
Principality of Reuss, senior and junior .....	..	11	11
Principality of Waldeck.....	..	3	3
Free City of Hamburg.....	..	3	3
Free City of Lubeck .....	..	2	2
Free City of Bremen.....	..	2	2
Kingdom of Bavaria.....	1	30	31
Kingdom of Würtemberg.....	1	74	75
Grand Duchy of Baden.....	3	77	80
Grand Duchy of Hesse.....	3	7	10
Grand total.....	<u>77</u>	<u>1,664</u>	<u>1,741</u>

This does not include the following :

1. German Agricultural Society, established 1860, in Heidelberg.
2. German Fishery Association (1870) in Berlin.
3. South German Agricultural Society.
4. Central German Horse-breeding Society.

## ENTOMOLOGICAL RECORD.

BY TOWNEND GLOVER, ENTOMOLOGIST.

LARVÆ IN TERMINAL SHOOTS OF PEACH.—In examining peach-orchards in the neighborhood of the Maryland Agricultural College, about the first week of May, almost all the young twigs of the trees were observed to be killed at the extreme point or end for a distance of 1 to 2½ inches, and the terminal buds entirely destroyed. On cutting open these dying twigs, the injury was found to be caused by a very minute caterpillar, which, entering the twig near a bud, had entirely eaten out the pith and interior, leaving only its “frass” and the exuding gum, to mark the spot where it had entered. When confined in a glass case, after about a couple of weeks, several of the larvæ left the injured twigs, and formed very loose cocoons on the sides of the box, or among the rubbish and old leaves lying scattered on the earth, and in about six to



ten days the perfect moth appeared. Specimens were forwarded to Mr. V. P. Chambers, of Covington, Kentucky, who is making a special study of our micro-lepidoptera, and he decided it to be *Anarsia* (Zeller) *pruinella*, (Clemens,) probably *A. lineatella* (Zeller) of Europe, (Fig. 10,) the larva of which was described by Mr. Clemens as taken June 16, full grown, and about to transform on the limbs of a plum, but no food-plant is mentioned. The tail of the pupa is attached to a little button of silk, in an exceedingly slight cocoon. There was scarcely a single young tree in the peach-orchard examined, that was not more or less injured by this little pest, and at least as many as twenty to fifty injured twigs were found on some very young trees. After the insect leaves the twig, the injured part dries up and breaks off. This insect was also seen, though in much smaller numbers, last season, in Maryland and Virginia, and apple-trees are also frequently observed injured in a similar manner in Maryland, and it is probable that the damage is done by the same worm, but as we have not yet succeeded in breeding them from the apple, we cannot say with certainty.

The larvæ are about 0.25 of an inch in length, head black, body dark reddish brown, with lighter rings, the third ring being more conspicuous and whitish; the moth is quite small, and measures 0.40 to 0.60 of an inch in expanse of wings, and is of a pale-gray color, with a few blackish spots on the upper wings. Should this insect increase in numbers as much during the next year as it has done since the last, it threatens to be a great scourge to peach-growers. The only way to destroy them is to go around the peach-orchard in May and June, and cut off such terminal shoots as appear to be withering or drying up, and then burn them with the caterpillars inside. This at least would prevent their multiplying to such an extent as to be very injurious at present. When not so very numerous, they appear only to serve to somewhat prune the trees, as they take off merely the tips of the branches.

**MITES IN PEAR-LEAVES.**—In May many leaves of the pear-tree were observed to be covered with dark-brown blotches somewhat like a fungoid growth, but upon examination by Mr. Taylor, microscopist of the Department, these blotches were found to be inhabited by myriads of small mites almost invisible to the naked eye. These mites appear to run all over the leaves, but especially to burrow in the brown patches, which appear to be entirely eaten out by them. Their bodies are long, cylindrical, yellowish white, with only two pairs of legs, placed very far forward near the head, and they move with considerable agility. They are also marked with a multitude of rings, and have two long hairs or bristles and two shorter ones on the end of the abdomen. There is a somewhat similar mite mentioned by Packard as the *Pyphlodromus pyri*, of Sheuten, which is said to live under the epidermis of pear-leaves in Europe, but no mention is made of the brown blotches on the leaf, apparently formed by the mite. In his figure also the head is much more obtuse than those examined in the Department. A thorough drenching with whale-oil soap-suds would doubtless destroy many of them, as their bodies appear to be very soft. All infested leaves, likewise, should be immediately removed and burned as soon as discovered.

Fig. 10.

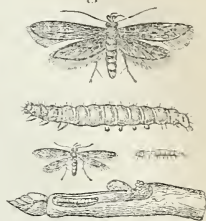


Fig.



**INSECT INJURIES.**—The Colorado potato beetle (*Doryphora decem-*

*lineata*) has made its appearance in Pennsylvania in two counties, in one of which the damage is reported as quite light. South of Mason and Dixon's Line this insect is reported in one county in each of the States of Virginia, North Carolina, Alabama, and Tennessee, but in all these the injuries are reported small. Their greatest annoyance is in the States north of the Ohio River. In Ohio several counties report greater or less injuries, not so severe, however, as those reported from Michigan. In Indiana this beetle is more or less destructive, while in several counties of Illinois it is despairingly pronounced a permanent scourge. In one county only (Outagamie, Wisconsin) are they pronounced worse than in 1871. In Minnesota and Iowa they are disappearing in most of the counties reported, while in Kansas they are but incidentally mentioned. In Clarke County, Virginia, the *Cantharis* or common potato beetle is injuring the crops to some extent. The counteracting agency of other insects destroying the Colorado beetle is mentioned with much satisfaction in different parts of the country. The ravages of this insect are comparatively trifling the present year. A correspondent in Erie County, Ohio, states that the Colorado potato-beetle abounds, this being their worst season; but by concert of action through the county it is kept in check; that when the weather is hot, the best way to destroy them is to keep the land well cultivated, and when the light, well-pulverized soil is hot, in the middle of the day, knock them off the vines, and the heat of the ground will kill them. When the weather will not admit of this, a tablespoonful of Paris green in a painful of water sprinkled on the vines will be effectual.

**CUT-WORMS.**—The cut-worm is reported in a few counties of New England and the Middle States as destructive to corn, tobacco, meadows, and fruit. In North Carolina an insect, probably another variety of the cut-worm, is reported as injuring cotton. In Sullivan County, Tennessee, the worms are dug out of the ground, as many as sixty having been found in a single hill of corn. In Upshur County, West Virginia, and in several counties in Ohio, Michigan, and Indiana, the ravages of the cut-worm have been quite severe. This insect is occasionally mentioned in the reports from Illinois and Missouri.

**LOCUSTS.**—The locust or *Cicada* has made its regular seventeen-year visitation in Wise County, Virginia, especially injuring young fruit orchards. Locusts also are annoying the peach-growers of Madison County, North Carolina. In Red River County, Louisiana, they injured young cotton-plants. In Richland County they appeared May 14 and departed June 12. They were present in immense numbers in Laurel County, Kentucky, from May 13 to June 20, but did no serious damage. They were more destructive, however, in Shelby, Jefferson, Jackson, and Pulaski Counties. They are reported also in Highland County, Ohio.

**APHIDES.**—Aphides or plant lice have been found in the hops in Oneida County, New York. In Bladen, Moore, and Perquimans Counties, North Carolina, and in Marlborough County, South Carolina, this pest has been annoying to the cotton-planter.

**CATERPILLARS.**—A small, dark grey caterpillar has injured the gooseberries and currants in Lehigh County, Pennsylvania. Rice caterpillars have been destructive in the rice districts in Georgetown County, South Carolina, and in Glynn County, Georgia. In Crittenden County, Arkansas, caterpillars are at work among the apples. In Kane County, Utah, this pest is devouring the corn.

**GRASSHOPPERS.**—Grasshoppers are numerous, but not destructive, in Milam County, Texas, and are reported in Rice County, Kansas. In Morgan County, Utah, they destroyed half the spring grain and a fourth of the potatoes.

**ARMY WORMS.**—Ravages of insects bearing this name are reported in Pike and Posey Counties, Indiana, in White County, Illinois, in Jefferson County, Iowa, and in Nevada County, California.

**CHINCH-BUGS.**—The chinch-bug was destructive in Madison, Lawrence, Washington, Perry, Clinton, Clark, Crawford, and Effingham Counties, Illinois; in Polk, Jefferson, St. Clair, Lewis, Marion, Montgomery, Reynolds, Vernon, Harrison, Perry, Iron, Dallas, and Johnson Counties, Missouri; in Bourbon, Franklin, Miami, Osage, and Coffee Counties, Kansas, and in Thayer, and Nemaha Counties, Nebraska.

**MISCELLANEOUS.**—White grubs are complained of in Rhode Island, and Michigan; rose-bugs injured the grapes in Middlesex County, Connecticut. An unknown wheat fly is reported in Mecklenburgh County, Virginia. The wheat midge is reported in Putman County, West Virginia. Canker and measuring worms did great injury to the fruit in Delaware County, Ohio. In Lucas County, Iowa, an unknown insect seriously damaged the grapes and even killed the vines.

## CHEMICAL MEMORANDA.

BY RYLAND T. BROWN, CHEMIST.

**EXAMINATION OF MARLS.**—The marls which are associated with the tertiary belt lying between the Alleghany Mountains and the Atlantic coast are of more importance to the agriculture of the country than has been recognized heretofore. They consist of an accumulation of the remains of marine animals, chiefly shell-fish, closely allied to the species now existing in the neighboring bays and estuaries. Sometimes, however, the teeth of the shark are found in a good state of preservation. These remains are commonly imbedded in a very fine sand, which, on first exposure to the air, has a dark green color, but, on drying, becomes an ash gray or light lead color. These beds vary in thickness from a few inches to 10 or 12 feet. In most of these the remains have not undergone petrification, though the animal matter appears to have been almost entirely removed. In consequence of this most of the shells will crumble into powder on exposure to the air. The amount of organic matter in these marls is, therefore, very small, but nearly all the mineral elements of these ancient organisms remain in a form which can be made available in the production of crops.

The phosphoric acid is chiefly in combination with lime as a neutral phosphate, and consequently is insoluble; but the disintegration of the shells reduces it to so fine a state of division that the phosphate, under the influence of carbonic acid, passes slowly into an available form. A portion, however, of the phosphoric acid is in combination with iron, from which it is readily liberated in the presence of potassa or lime.

The alkalis (chiefly potassa) are in combination with silica and iron, forming a double silicate of potassa and iron which is insoluble in water; but, on exposure to the air, the compound is broken up by the iron passing into the form of a peroxide, the remaining elements being resolved into silicic acid and soluble silicate of potassa, which is available for the use of crops.

The supply of marl in the belt above alluded to appears to be practicably inexhaustible; but the quality differs materially in the different beds even in the same vicinity, as will be seen by the following:



*Analysis of marls from the vicinity of Marshall Hall, Charles County, Maryland.*

## No. 1.

Organic matter and moisture.....	2.030
Carbonate of lime.....	54.070
Carbonate of magnesia.....	1.304
Phosphoric acid.....	0.350
Peroxides of iron and alumina.....	2.955
Alkalies.....	1.000
Silica.....	38.291
	<hr/>
	100.000

## No. 2.

Organic matter and moisture.....	1.900
Carbonic acid.....	1.214
Phosphoric acid.....	0.653
Lime.....	9.465
Peroxides of iron and alumina.....	2.207
Alkalies.....	0.800
Silica.....	83.761
	<hr/>
	100.000

## No. 3.

Water.....	1.950
Organic matter.....	1.980
Carbonate of lime.....	35.504
Carbonate of magnesia.....	3.550
Phosphoric acid.....	0.210
Peroxides of iron and alumina.....	6.095
Alkalies.....	0.500
Silica.....	50.211
	<hr/>
	100.000

No. 1 is a fair average specimen of shell-marl, containing in a ton (2,000 pounds) 1,080 pounds of carbonate of lime, 6 pounds of phosphoric acid, and 20 pounds of alkalies, chiefly potassa. No. 2 is a green-sand marl, containing but 189.30 pounds of lime and 16 pounds of alkalies per ton, but giving 13 pounds of phosphoric acid in that weight.

The mineral elements for a crop of 25 bushels of wheat per acre (the straw being returned to the soil) will be furnished by  $2\frac{1}{2}$  tons of No. 1 or  $1\frac{1}{2}$  of No. 2 per acre. These marls, when dried, can be easily powdered, so that they can be readily distributed by means of a drill, or scattered broadcast over the ground. In this condition they may be mixed with bone-meal, superphosphate of lime, guano, or any other fertilizer that the farmer may choose to use. The marl, fresh from the bank, may be composted with barn-yard manure to a good advantage.

The large amount of lime and sand with which its more valuable ingredients are mixed will forbid the transportation of this marl to any great distance; but farmers living within reach of them will find in these marl-beds a cheap and valuable means of enriching their soils.

MINERAL CONSTITUENTS OF WHEAT.—A series of very interesting experiments, conducted by R. Heinrich, are given in *Ann. der Landwirtschaft*. The object of the experimenter was to ascertain the relation which lime, potassa, and phosphoric acid bear to the several proximate elements of the grain. The grain was subjected to analysis at five different stages of its growth: 1. The ovaries were collected and analysed while the plant was in bloom. 2. Fourteen days later another examination was made. 3. At the end of another fourteen days,

when the wheat began to ripen, another analysis was made. 4. Seven days later the wheat was cut and analysed; and, 5, fourteen days after harvest the grain, thoroughly dried, was examined. This series of analyses appears to establish the following ratios: 1 part of potassa to 11 parts of gummy matter; 1 part of lime to 43 parts of woody fiber; 1 part of phosphoric acid to 2 parts of nitrogen in the albuminoid compounds of the grain.

The author dwells particularly on the ratio existing between the lime and the cellulose or woody fiber. If lime be deficient, true woody fiber will not be developed beyond this proportion, and the result will be that the straw, consisting of loose cellular structure, will be disposed to fall; for this ratio appears to relate to the straw as well as to the grain.

Tendency to "lodge" in grain has generally been attributed to a deficiency of silica in an available form in the soil; but these experiments seem to controvert that theory; yet there is a link wanting to secure the conclusion which the author reaches. If he had given us the proportion of silica at every stage of the growth, as well as that of lime, &c., we should have had an intelligible basis for a conclusion. In the enamel of straw the silica exists as a silicate of lime and potassa, and consequently must exist in definite proportions.

**PRODUCTION OF NITROGEN COMPOUNDS IN SOILS.**—In a French journal (*Comtes Rendus*) we find a very interesting account of a series of investigations relating to methods by which nitrates are formed in the soil. Two tracts were selected, adjacent to each other in the commune of Saussemesriel, and but a short distance from the sea-shore. One of these tracts was covered with an oak forest, and the other, originally in the same condition, had been in cultivation five years, and in that time had received two dressings of quicklime of 10,000 kilograms per hectare, each, (8,500 pounds per acre nearly.) This soil originally consisted of a clay highly charged with iron, mixed with a considerable quantity of fine gravelly sand derived from the Silurian sandstones.

The samples were selected after a long drought in the month of August, and consisted of both surface and subsoil, which were examined separately. On treating these soils with dilute acid it was found that the forest soil was entirely destitute of lime, while the cultivated field showed 1.583 per cent. of lime in the surface-soil and 0.609 in the sub-soil.

A portion of soil from each of the fields (35 kilograms, or 72 pounds,) was subjected to percolation for the purpose of ascertaining its soluble contents. This solution was found to contain in 950 cubic centimeters, as follows:

	Forest. Millig.	Cultivated field. Millig.
Organic matter.....	155	70
Silica.....	35.5	29
Chlorine.....	600.5	2070
Sulphuric acid.....	5.6	32.6
Nitric acid.....	0	707
Phosphoric acid and iron.....	5.7	5.8
Potassa.....	69	25.8
Soda.....	287.7	180.7
Magnesia.....	68.6	90

The remarkable feature in the above table is the entire absence of nitric acid in any combination in the forest soil, while that from the cultivated field shows a fair proportion, and yet no nitrogenous substance had been used as manures on that field.

The writer claims that the investigation proves that under favorable circumstances atmospheric nitrogen may be converted by quicklime into nitric acid, and thus made available for the use of crops. It remains, however, to be determined what are the peculiar circumstances under which this favorable action takes place. An inspection of the above figures will show the large amount of chlorine and the comparatively small proportion of soda in the cultivated soil. This chlorine must have been derived from the sea-spray, and was therefore originally in the form of chloride of sodium, but it now exists in combination with the metallic base of lime. The writer concludes that transformation of common salt into chloride of calcium constitutes the condition favorable to nitrification in the soil.

**TEMPERATURE OF THE SOIL.**—MM. Becquerel and Edm. Becquerel have published a memoir upon some observations made with the aid of an electric thermometer, so arranged that the temperature of places and objects at some distance from the observer may be determined. These gentlemen have applied it to the determination of the comparative temperatures of bare soil, and that covered with low vegetation. In order to obtain the average temperature for the year the observations were made during the last five days of August, the months of September and October, at the hours of six and nine in the morning, and three and six in the evening. The averages of these results were calculated and arranged in tables.

The instrument was placed under the soil at depths of 0.05 and 0.10 meter, (2 and 4 inches nearly.)

The average of the observed temperature (reduced to Fahrenheit) was as follows :

		2 inches.	4 inches.
August, 1871....	{ Covered soil.....	72	71.8
	{ Bare soil.....	79	75
September, 1871.	{ Covered soil.....	65	64.8
	{ Bare soil.....	67	65
October, 1871....	{ Covered soil.....	50.5	50
	{ Bare soil.....	50.6	50.4

The average of the morning observations, which were made at 6 o'clock a. m., shows clearly the cooling effect of exposure :

		2 inches.	4 inches.
August.....	{ Covered soil.....	68.8	69.9
	{ Bare soil.....	64.5	67.3
September.....	{ Covered soil.....	61	62.8
	{ Bare soil.....	58	59.7
October.....	{ Covered soil.....	49	50.5
	{ Bare soil.....	45	45.8

From the above figures we learn that the average temperature of the bare soil was 5.5 degrees higher than that covered with vegetation, but the morning temperature of the covered soil was 3.8 degrees warmer than that which was exposed.

**CARBOLIC ACID FROM LIVING VEGETATION.**—M. Broughton, government chemist attached to the cinchona plantations of Ootacamaud in India, has obtained carbolie acid from the *Andromida Leschmantii*, a plant which grows abundantly in that section. The product is less deliquescent than that obtained from coal-tar; but the method employed for obtaining it is too expensive to allow it to be placed in the market against the acid produced by the usual method.

**ABSORPTION OF WATER BY LEAVES.**—The recent investigations of M. Calliet on the absorption of water in the liquid form by the leaves of plants, have led him to the conclusion that plants do not absorb moist-



are by means of their leaves when they can receive a sufficient supply through their roots; but when the ground becomes so dry that this source fails, if water be furnished to the leaves it will be absorbed by them. This is not a natural function of the leaf, but a vicarious action.

COMPOSITION OF CREAM.—An examination of the composition of cream, by Dr. Hamberg, in Stockholm, gives as the result in several analyses:

	Per cent.
Butter .....	29.46
Casein .....	4.22
Milk sugar .....	2.08
Coloring and extractive matter .....	0.56
Phosphoric acids and alkalies .....	0.22
Chlorides of soda and potash .....	0.18
Water .....	63.28
Total .....	100.00

The specific gravity of the milk was 1.0309; of cream free from milk, 1.0049 to 1.0055. At a temperature of 155 C., in ten hours 10.5 per cent. of cream raised, which was analysed by the method of Haidlen. A better cream, obtained in the fall, gave: Butter, 34.75 per cent.; other solid matter, 6.65 per cent.; water, 58.06 per cent.

Milk exposed to a high temperature gave a more concentrated cream, but less in quantity, and not proportionally rich in butter, while, when the milk was allowed to sour, the amount of coagulable casein was much increased.

CONSTITUENTS OF STUBBLE.—Dr. H. Weiske has examined the quantity and composition of the stubble left after harvest.

For determining the quantity, eight squares, in different parts of the field chosen, were dug ten inches deep, and the stubble separated by sifting and washing, then dried at 100° C., with the following results:

Name of plant.	Before drying, weighed—	After drying, at 100° C.	Estimated pounds weight, per mor- gen.*	Name of plant.	Before drying, weighed—	After drying, at 100° C.	Estimated pounds weight, per mor- gen.*
	<i>Grams.</i>	<i>Grams.</i>			<i>Grams.</i>	<i>Grams.</i>	
Lucern .....	475.8	427.8	5,544	Lupine .....	364.0	312.8	2,027
Red clover .....	451.9	394.3	5,116	Wheat .....	353.3	307.7	1,994
Esparectte .....	307.8	262.4	3,401	Peas .....	332.0	285.1	1,848
Rye .....	510.0	466.0	3,019	Serradella .....	163.3	138.5	1,795
Wund clover .....	255.8	221.5	2,870	Buckwheat .....	226.3	194.2	1,259
Rape .....	234.0	197.3	2,557	Barley .....	207.0	176.3	1,142
Oats .....	385.0	334.5	2,167				

\* The Prussian morgen = 3,054 square yards or 0.6310 acre.

The great quantity of roots left by red clover may account for its value as a green manure. The difference would probably be still more decided if the portions growing below ten inches from the surface were taken into the account.

The following table gives the amount of organic matter, nitrogen, carbon, and ash:

Kind of plant.	Organic matter.		Nitrogen.		Carbon and ash free from carbonic acid.	
	In 100 parts.	Pounds per morgan.	In 100 parts.	Pounds per morgan.	In 100 parts.	Pounds per morgan.
Rye.....	68.70	2,074	1.25	37.56	31.30	945
Barley.....	80.92	924	1.15	13.20	19.08	218
Oats.....	61.78	1,339	0.71	15.36	38.22	828
Wheat.....	68.68	1,369	0.68	13.56	31.32	625
Red clover.....	78.48	4,015	2.15	110.04	21.52	1,101
Lucern.....	87.60	4,856	1.41	78.24	12.40	688
Esparcette.....	82.74	2,814	2.08	70.80	17.26	587
Wund clover.....	80.50	2,311	2.04	58.68	19.50	559
Serradella.....	82.54	1,482	2.07	37.20	17.46	313
Buckwheat.....	78.82	992	2.18	27.48	21.18	267
Peas.....	79.17	1,463	1.76	32.52	20.83	385
Lupine.....	84.45	1,711	1.76	35.76	15.55	316
Rape.....	86.00	2,200	1.37	34.92	14.00	357

The mean of two analyses of the ashes gives, by estimation, the following table of mineral constituents contained in a morgan of stubble :

	Rye.	Barley.	Oats.	Wheat.	Red clover.	Lucern.	Esparcette.	Serradella.	Buckwheat.	Peas.	Lupine.	Rape.
Lime.....	42.1	24.3	49.2	44.1	150.2	112.8	67.2	45.9	46.0	41.3	46.2	71.0
Magnesia.....	8.3	3.2	7.0	5.9	28.3	14.0	18.2	7.8	4.2	6.4	7.0	7.5
Pottassa.....	18.0	5.6	14.3	10.6	46.9	21.1	24.5	5.1	5.3	6.5	9.2	27.1
Soda.....	24.3	2.0	10.4	6.5	11.5	15.5	8.0	2.8	2.5	4.1	2.1	12.1
Sulphuric acid <sub>3</sub> .....	7.0	3.2	5.1	4.3	14.9	10.7	11.9	5.3	3.9	5.5	4.1	17.9
Phosphoric acid <sub>5</sub> .....	14.6	6.9	17.3	6.8	43.0	22.6	17.1	10.6	6.3	8.6	8.0	18.4

**THE VALUE OF HUMAN EXCREMENT AS A FERTILIZER.**—Mr. Lepmann, director of the Central Trial Station in Bavaria, makes an estimate by which to determine approximately the value, for fertilizing purposes, of the human excrement annually wasted at the city of Munich. After contrasting the practice among the Japanese of carefully saving and using every particle of such manure, with the practice in Europe of utterly wasting the same, and then sending fleets thousands of miles for guano to make up for that waste, he states that the amount of guano furnished by Peru yearly for the German fields is about 1,000,000 cwt. This contains 13,000,000 pounds (German) nitrogen, 12,000,000 pounds phosphoric acid, 2,000,000 pounds potash. The city of Munich contains 177,600 inhabitants, each of whom, according to statistics, consumes a daily amount of food the constituents of which are equal to 15 grams of nitrogen, 5 grams of phosphoric acid, and  $3\frac{1}{2}$  grams of potash. This would make the total for one year 1,868,070 pounds of nitrogen, 622,690 pounds of phosphoric acid, 373 pounds of potash. But this does not all become waste; a portion is required for the growth of the non-adult population. According to the census of 1867 there were 73,556 of this class. Estimating the average yearly increase from infancy up to adult age at 4 pounds for each, the total yearly growth of human flesh, fat, and bones in the city, in one year, would be 294,224 pounds. This would require 10,386 pounds of nitrogen, 11,636 pounds of phosphoric acid, and 1,239 pounds of potash. Deducting these from the amounts included in the total of food consumed, and there will remain as the sum of fertilizing elements wasted in the human excrements of the city for one year, 1,857,714 pounds of nitrogen, of which the commercial value

is 866,934 gulden; 611,054 pounds of phosphoric acid, value 122,210 gulden; 372,375 pounds of potash, value 49,650 gulden; total value 1,038,794 gulden, equal to about \$500,000. This sum would be still further increased by adding to it the value of the humus-forming constituents of the excrements wasted.

Mr. Lepmann states that Germany now possesses a system by which he is confident this enormous waste may be entirely prevented, called there the Tonnen (barrel) system. The city of Gratz, containing 80,000 inhabitants, has this system in use in every house, and has thus demonstrated the practicability of using it in large cities. As an illustration of the profit to be derived from human excrement when fairly tested as a fertilizer, Mr. Lepmann refers to the fact that between the years 1850 and 1864 the price of that obtained from the barracks increased forty-five fold.

## BOTANICAL NOTES.

BY GEORGE VASEY, BOTANIST.

**THE COTTON-WOOD TREE.**—A correspondent from Hardin County, Iowa, (M. J. F. Hardin,) writes respecting the cotton-tree mentioned in the report of last month. The tree named in that report is the white poplar, (*Populus alba*), an imported tree, which our correspondent has mistaken for the cotton-wood of the West. We quote his remarks because we think they will be of interest in the region from which he writes:

I read, in reference to the cotton-tree, that "there is a period of eight or ten days during which the air is filled with the cottony down of the seeds, causing much annoyance," which is literally true—and even more, a positive nuisance to every housekeeper who has this tree for shade. It fills the nose, and perchance the mouth, while asleep, and the eyes in addition while awake, the milk-pan, the cream-cup, and every closet or room where an open window or door will permit its ingress, and yet it is quite a popular tree with us prairie farmers, and is becoming more so from the fact of its hardiness and rapid growth, as every one who chooses can have the comfort of a shady grove of from 10 to 20 feet in height in *five* years. But my object in writing is to inform all who will profit by the information that there is no need of the annoyance referred to.

The cotton-wood is dioecious, and hence all this annoyance of flying cotton can be prevented by taking cuttings from *male* trees only. The cuttings grow rapidly when set out in rows or in plantations for groves, and in *five* years' time will make *larger and finer* trees than *young trees* of 4 feet high transplanted at the same time, as has been proven by thousands of prairie farmers who have tried it. The selection of cuttings from male trees can be made about the 1st of June, when the cotton is flying from the female trees, but the male trees will be observed to have none. I would like to inquire if there is any distinguishing mark between the male and female cotton-wood trees except while in blossom. I have not been able myself, from close observation, to observe any difference, but still hope there is some one yet to be discovered. If there is, a person need not be confined to the time of flowering in order to select cuttings from male trees, which would be a great convenience to all cotton-wood planters."

We know of no distinctive mark between the male and female cotton-woods except that which is apparent at the flowering time. The male trees are in blossom and shed their pollen some two or three weeks before the female trees shed the seed. A little observation will distinguish the male flowers, but the proper way would seem to be to observe and *mark* a male tree and take cuttings therefrom at the most suitable time.

**OUR NATIVE OAKS.**—The North American oaks are a very interesting group of trees, and include a large number of species, each having



a more or less extensive range. In the district east of the Rocky Mountains we have about twenty-two species; west of the Missouri River they become very scarce, gradually disappearing before the base of the mountains is reached. The central chain of the mountains furnishes but one or two species. The western slope of the Sierra Nevada presents eight or ten species, and Mexico and Central America many more.

The oak family is, perhaps, on many accounts, the most valuable of forest-trees. Its value depends chiefly upon its quality and abundance as a timber-tree. It would be difficult to supply its place in ship-building and in many of the useful arts, including its extensive employment in the construction of railroads. Almost nothing has yet been done in this country in the way of planting or cultivating the oaks, but it is desirable that the attention of our people should be directed to the importance of this subject, and to the kinds most valuable and most easily cultivated. Although it is a tree of slow growth, yet, with our accustomed thoughtlessness for the future, we have pressed it into our service without stint or measure, and we are just beginning to wake up to a realization of the fact that we are ruthlessly destroying the noblest forests in the world without making provision for their reproduction. In order to facilitate the study of this noble genus of trees, and to direct attention to the different kinds, we propose to give a short account of their general characteristics and their classification.

The principal characters of the genus are as follows: Trees or shrubs with alternate leaves, and with sterile and fertile flowers separate; the sterile ones on slender, thread-like, drooping stems; the fertile ones small and inconspicuous, consisting of a three-celled ovary, inclosed by a scaly covering, which, when enlarged, becomes a kind of cup to contain the fruit or acorn. Although the ovary is at first three-celled, with two ovules in each cell, yet but one of the ovules is fertile, and that one enlarges to fill the whole cavity.

All our species of oaks are divided into two sections, distinguished by the time occupied in the full development of the fruit. First, those which mature the fruit in one season, and hence called annual fruited; and second, those whose fruit is two years in acquiring maturity, and called biennial fruited. The first section includes the white and chestnut-oaks and the live oak of the Southern States. Of these the leaves usually have blunt lobes; and the acorns are sweet or sweetish, and some of them edible. In this section the acorns are produced on the *new* twigs, *i. e.*, the twigs of the same season's growth, and they are generally more or less stalked. In the second section the leaves are either entire or lobed and bristle-pointed; the acorns are bitter, and are matured on the twigs of the last season, and *below* the new shoots. This section includes the red and black oaks, the Spanish and pin oaks, and the willow-leaved oaks. Although these are called biennial fruited, it is not meant that they produce fruit only once in two years. The *young* fruit is formed on the new twigs, but it remains in a dormant state until the second year, when it swells and matures. On these trees, therefore, there is usually a crop of young fruit and a crop that is maturing.

The following sketch will give a comprehensive view of the species east of the Rocky Mountains, with some observations on their range and variations:

#### SECTION 1.—ANNUAL FRUITED OAKS.

##### *Bur-oaks.—Leaves lobed.*

1. Bur-oaks—*Quercus macrocarpa*, Michaux.—This tree has its largest development in the Western States, particularly in Illinois, Wisconsin,

Minnesota, and Iowa. It was the principal tree of the oak openings of the West, which have nearly disappeared under the advance of cultivation. It extends sparingly into the Eastern States, being found in Western New York and in Western Massachusetts. It has its common name from the peculiar fringe of the cup, made by an elongation of the scales or modified leaves of which the cup is composed. The acorn is usually nearly and sometimes completely inclosed by the cup with its mossy fringe, hence it is sometimes called the overcup-oak.

2. Southern overcup-oak—*Quercus lyrata*, Walt.—This species is common in the Southern States. Chapman says, "Florida to North Carolina." Dr. Cooper extends its range to Louisiana and Mississippi. But inasmuch as it has recently been detected in Southern Illinois, it is probable that it is more extensively distributed than has been supposed. There is reason to believe that it will be one of the most valuable of the genus for cultivation. It has a large depressed acorn, mostly inclosed in the cup, which is not fringed on the edge. The leaves are from 5 to 10 inches long, rather crowded at the end of the twigs, bright green and shining above, and whitish on the under side.

3. Post-oak—*Quercus stellata*, Wang.—This is the *Quercus obtusiloba* of Michaux. It is usually a smallish tree, of very dense wood, which is especially valuable for posts. Its range is very extensive, being found in most of the States east of the Rocky Mountains, but the quantity is limited, except in certain localities. In some of the Western States it occupies large tracts of low land, which are called post-oak flats.

4. White-oak—*Quercus alba*, L.—This tree is probably more widely distributed than any other native tree, occurring, undoubtedly, in every State of the district mentioned. It is too well known to need any particular description.

*Chestnut-oaks.—Leaves toothed but not lobed.*

5. Chestnut-oak—*Quercus prinus*, L.—There is yet some confusion respecting the Chestnut-oak. Michaux made but one species with five varieties, but most botanists hold these, or several of them, to be distinct species. There is yet room for much investigation respecting them. The species we have named is called by Chapman the swamp chestnut-oak, from its growing in low grounds. Dr. Gray says, "Dry or moist ground, common southward, scarce northward."

6. Swamp white-oak—*Quercus bicolor*, Willd.—This is the *Quercus prinus*; var. *discolor* of Michaux. It has rather large obovate leaves, narrowed at the base, whitish downy underneath; with large acorns one inch long or more, which are long stalked and about half inclosed in the cup, which is sometimes a little fringed on the margin. It is quite a common tree on low grounds and river bottoms.

7. Yellow chestnut-oak—*Quercus Castanea*, Muhl.—This is a smaller tree than the preceding, growing on more elevated land, frequently on hill-sides and rocky ground. Its leaves much resemble those of the chestnut, (*Castanea vesca*.) The acorns are only about half the size of the swamp white-oak, and not stalked. It is quite widely distributed over the country, from Maine to Georgia, and on the west to Missouri and Arkansas, but quite sparingly in quantity.

8. Chincapin-oak—*Quercus prinoides*, Willd.—This is a shrub from 2 to 6 feet high, with leaves closely resembling in form those of *Q. prinus* but much smaller. It produces an abundance of small sweetish acorns, and is usually found on poor land. It is common in the New England States, and extends southward to Florida, and westward to Wisconsin,

Iowa, and Missouri. It is the variety *pumila* of Michaux. Dr. Gray, in one edition of his Botany, reduces it to a variety, but at a later date restores it to the rank of a species.

*Live-oak*.—Leaves mostly without teeth, evergreen,

9. *Live-oak*—*Quercus virens*, Ait.—This valuable oak is found as far north as Norfolk, Virginia, but principally farther south, where it becomes a large tree. On the west it extends to Texas. The timber has a world-wide reputation in ship-building.

#### SECTION 2.—BIENNIAL FRUITED OAKS.

*Willow-oaks*.—Leaves generally entire, thick, and persistent, and some becoming evergreen far south.

10. *Upland willow-oak*—*Quercus cinerea*, Michaux.—This is a small tree, occurring rarely north of North Carolina, but common in the dry pine barrens of the Southern States, and extending west to Texas. It has small lance-oblong leaves, white downy beneath. The acorns are small, roundish, and about one-third inclosed in the shallow cup.

11. *Common willow-oak*—*Quercus phellos*, L.—This is the willow oak of the Middle Atlantic States, extending south to Florida, and west to Kentucky. It is a pretty large tree, attaining a height of 50 feet, and is distinguished by its willow-like leaves. It is commonly found in low woods, or on the margin of swamps and streams. The fruit much resembles that of the preceding.

12. *Shingle-oak*—*Quercus imbricaria*, Michaux.—This is also sometimes called *Spanish-oak*, which name properly belongs to *Quercus falcata*. It is a tree of moderate size, with smoothish black bark, leaves 4 to 5 inches long, thick and shining, not toothed or lobed. The acorn is roundish, small, half an inch long, in a shallow cup. It is quite common in some of the Western States, becoming most abundant in Kentucky and Tennessee, and reaching westward to Arkansas and southern Kansas. Its wood is of little value, making even poor shingles.

*Black oaks*.—Leaves thick, broadest at the top, slightly lobed or entire.

13. *Water oak*, *Quercus aquatica*, Catesby.—This tree is a native of the Southern States, having its northern limit about Richmond, Virginia, and extending west to Arkansas. It grows from 40 to 50 feet high, has firm tough wood, with smooth bark, except on old trees. The leaves are very peculiar in form, being somewhat fiddle-shaped, or having a long narrow wedge-shaped base, expanded at the top into a broad, somewhat three-lobed summit. They are about 3 inches long, and 1 to 1½ inches broad at the top. The acorn is about half an inch long, in a shallow cup.

14. *Black jack*—*Quercus nigra*, L.—This is a small-sized tree, from 15 to 25 feet high, growing mostly in thin soil, and forming a dense roundish head. The leaves are thick and leathery in texture, 5 or 6 inches long, broad at the top, usually with three bristle-pointed lobes, gradually narrowed below, and having a very short stem or petiole. They are covered with a rusty down on the under surface, as are also the young twigs. The acorn is short and roundish, and about half inclosed by the rough-scaled cup. It ranges from New Jersey to Florida, and westward to Texas and Arkansas, being very abundant in some localities, and quite absent over other wide tracts of country.

15. *Black scrub-oak*—*Quercus ilicifolia*, Wang.—A small scrubby oak, growing from 3 to 8 feet high, and ranging, according to Dr. Gray, from New England to Ohio and Kentucky.



*Red oaks.*—Leaves mostly with deep-spreading lobes, bristle-pointed or sharp.

16. Spanish oak—*Quercus falcata*, Michaux.—This is a large tree, having a pretty wide range from New Jersey southward and westward, being most abundant probably south of the Ohio River. The leaves are usually long-stalked, large, and of peculiar shape, having on each side one or two long, narrow, somewhat hooked or sickle-shaped lobes, the point of the leaf generally with several long pointed teeth. The bark is said to be excellent for tanning. The acorns are small, roundish, and in shallow cups.

17. Red oak—*Quercus rubra*, L.—The oaks of this division are much confused by common observers, and are indiscriminately called black oaks or red oaks. It is desirable, if possible, to have each common name specially applicable to one species. This will be done only as the result of closer discrimination of the different species. The red oak of the botanist (*Q. rubra*) is one of the largest of the family. Very large trees of this kind may often be found in bottom lands, having a trunk three feet or more in diameter and without branches to the height of 20 or 30 feet. The bark on large trees is very thick and deeply checked, and is valuable for tanning. The wood is coarse and poor. The leaves are usually large, with about four lobes on each side, which point forward quite uniformly toward the apex. The acorns are much larger than in any other oak of this division, and are quite constant in shape and size. The cup is always shallow, and about as wide as the acorn is long. The species is found over nearly the whole of Eastern North America.

18. Scarlet oaks—*Quercus coccinea*, Wang.—This species is probably more variable in leaf and fruit than any other of our oaks. It includes several varieties which some botanists consider distinct species. Its range is as wide as that of the preceding, and it is much more abundant. The leaves are usually more deeply cut, with more side lobes, the acorns smaller, and the cup smaller and deeper.

19. Pin oak—*Quercus palustris*, Du Roi.—The pin-oak has a wide geographical range, but is abundant only in certain localities. It is found in low and swampy ground, and in general appearance much resembles the scarlet oak. The leaves are shorter and more deeply divided, with only about three lobes on each side. The acorns are small and roundish, about half an inch long, and the cup very shallow. It extends, according to Dr. Cooper, from Massachusetts to the mountains of Georgia, and from Missouri to Texas.

20. Turkey oak—*Quercus Catesbii*, Michaux.—This is a small tree occurring in dry pine barrens in North Carolina and southward to Florida.

21. Georgia oak—*Quercus Georgiana*, Curtis.—This is a shrub, growing 6 to 8 feet high, which seems to have been observed only on Stone Mountain, Georgia. It produces an abundance of small acorns.

Several of the above-named species present well-marked varieties, and there are also a number of somewhat local forms which are considered to be hybrids. The best time to study the oak is about the time of the maturing of the fruit, when fully developed leaves and well-formed fruit may be obtained from the same tree, and specimens of both should be collected for identification.

## MICROSCOPIC INVESTIGATION.

BY THOMAS TAYLOR, MICROSCOPIST.

FIJI ISLAND COTTON.—When water is poured from a pitcher it generally partakes of a spiral motion, sometimes from left to right, at

other times from right to left. The spiral motion is modified by the form of the surface over which it passes. Were the mouth of the pitcher plastic, the spiral motion would modify its shape, bringing it into harmony with that motion—the tendency of the water to move in a spiral direction, so far as it had force to overcome the resistance of the plastic substance, would shape it in harmony with that tendency.

The animal and vegetable kingdoms exhibit many examples of organic bodies partaking of the spiral form; many varieties of shells display perfect tapering spirals, and generally they take the same direction, viz, from right to left, viewing them with their apex turned from us. There are exceptions to this rule; some have been found with the spiral thread winding from left to right. Many vines exhibit this tendency, especially those of rank growth. It has been observed that persons who have suffered from headaches or from fever, frequently lose their hair. As a remedy shaving of the head has been resorted to with good results. The hair grows faster, but it has been found to become wavy with a tendency to twist or curl when very frequently shaved during a term of years. The human hair differs from hairs on leaves in its mode of growth in some particulars. It has individual roots, and springs from under the epidermis. The hairs, or cotton threads, of the cotton-seed resemble, in some respects, the human hair. They spring from under the outer dark-brown skin or testa, and individually exhibit root formation. When a section of the cotton-seed is examined microscopically, it is found to consist of three principal parts, viz. the outer coating or testa, under which is situated a lining membrane composed of a series of double cells surrounding and inclosing the nucleus; from these cells the cotton fibers proceed. When a small portion of this series is combined with a little gum-water and ground to a fine pulp, the cells, viewed with a one-eighth object-glass, will be magnified to about three-fourths of an inch in length. They are perfectly transparent, and are seen to be banded near their centers. The cotton-thread or fiber is supposed to be a flat ribbon, although, when examining several sections of the roots of the fibers, I was convinced that the fiber is a flat, hollow tube resembling a ribbon. The twisting tendency of the cotton fiber is well known, its flat shape favoring that tendency. If the fibers, when growing or passing from their cells, obey the law which regulates the motion of liquids, as pointed out, we can account in a measure for their twisting and as the spiral forms of water issuing from an orifice are regulated by the pressure of water and shape of orifice, so may the tendency of the cotton fiber to twist depend on the pressure of the circulating fluids. The experiments of Hales and Burcks show that the pressure of the ascending vine-sap is sometimes so great that it will raise a column of mercury 38 inches. The pressure of the ascending sap of the cotton-plant has not yet been examined. The ranker the growth, theoretically, the greater will be the tendency of the fiber to twist.

The Department is informed by Mr. Isaac M. Brower, United States consul at the Fiji Islands, that sea-island cotton, which is an annual plant in the United States, becomes perennial in those Islands, and that its growth is much more vigorous there than here, and that for a term of years there is a continuous crop from the same planting. He has plucked cotton from a plant five years old, but the fiber is defective in one particular, and is objected to by the Liverpool merchants. They informed him that they feared that Fiji cotton is subject to some form of disease which caused it to knot, a fault which may be seen with the naked eye. Mr. Brower placed a specimen in my hands

for microscopic examination. I placed one of these knotty specimens on a glass slide, put on it a drop of gum-water, over which I next placed a glass disk, pressing it down, and submitted it to a power of about 75 diameters. The nature of the knots, so called, became evident. The cotton fiber had, in consequence of an extreme twisting motion, become so intertwined that an artificial knot was formed. Mr. Brower stated, on seeing the nature of the knot under the microscope, that the present system employed to separate Fiji cotton from the seeds, viz, the use of *rollers*, is apt to draw the knotted fibers more tightly than would be the case if the cotton-gin was employed.

A series of microscopic investigations on cotton of various growths, quick and slow growing, might lead to some practical and valuable results. In the mean time, I would suggest, as the most effectual remedy, the frequent renewal of the seed in the Fiji Islands.

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## FACTS FROM VARIOUS SOURCES.

**REMEDY FOR GRAPE-VINE ROOT LOUSE.**—M. Rogiers, mayor of Poulx, in the Department of Gard, a prominent vine-growing district of France, proposes to the Agricultural Society of Hérault, as a tested remedy for the depredations of the *Phylloxera vastatrix*, the application of a pound of soot to the roots of each vine after a careful excavation of the earth, which is used to cover the soot. It is claimed that this application is effectual in destroying the insect as well as in preventing attacks.

**RAMIE.**—It is reported that at the first of July the crop on the ramie plantation of Mr. F. T. De Lacroix, New Iberia County, Louisiana, was fully matured. That planted last fall and this spring is short—not more than 2 feet in height; but the old crop is much better.

**JUTE.**—Mr. De Lacroix also has on his plantation several rows of the jute plant, the seed of which was sent to him by the Department of Agriculture. The plants are very vigorous, and the indications are that jute will thrive in that climate. It bears some resemblance to flax in appearance, as it is said to in fiber.

**TREE CULTURE IN CALIFORNIA.**—The legislature of California has passed an act the object of which is to encourage the culture of forest and timber trees. It provides—1. That the governor shall appoint three forest commissioners, and that a State forester shall be appointed by them at a salary of \$175 per month. 2. That the State forester shall collect, exchange, grow, and import seeds and seedlings of forest and timber trees, and shall distribute them gratuitously, but not more than 1,000 seedlings to one person the same year. For these purposes he is authorized to expend \$3,000 per annum. 3. That the supervisors in each county shall constitute a forest board, to aid in properly distributing the seeds and plants. 4. That a sum not exceeding \$500 may be expended in providing and distributing circulars in the interest of tree culture. 5. That the State forester shall have authority to expend \$3,000 the first year, and thereafter \$2,000 annually, in establishing and taking care of nurseries for rearing trees and acclimatizing foreign plants and trees; and that from these, shade trees shall be furnished for grounds and roads belonging to the State, counties, and cities. 6. That it shall be the duty of the State forester to collect and diffuse, in all practicable ways, information respecting the culture of forest



trees. 6. That every agricultural and horticultural society receiving aid in money from the State shall award 10 per cent. of the money so received in special premiums for the largest and best groves of planted forest and timber trees grown in five years from the time the act goes into effect.

**PALMETTO LEAVES FOR PAPER.**—Small shipments of palmetto for fiber have been reported heretofore. On the British steamer *Darien*, which cleared from Savannah for Liverpool July 6, Mr. Edwin C. Denig shipped four bales of palmetto leaves, which he sends to England to be tested as to their value as material for paper. As books and newspapers multiply rags diminish. The demand for other materials for the manufacture of paper is urgent and on the increase. The esparto grass—the “*Spartum*” of Pliny—which grows in Spain, Portugal, and Northern Africa, and which for some years has been very extensively used as paper-making material in Europe, is beginning to fail, making it necessary to secure some new fiber. Mr. Denig believes that palmetto leaves will compare favorably with esparto grass as material for paper, and that they can be profitably exported for that purpose.

**SILK RAISING IN CALIFORNIA.**—The impetus given to the raising of silk-worms in California was checked by the failure of the cocoon trade with Europe. The introduction of “family reels” for reeling the cocoons is not deemed desirable, manufacturers of silks usually preferring larger lots, carefully assorted, composed of threads which are uniform in size, luster, and quality. It is now proposed to establish, at central locations in silk-raising districts, reeling factories, or “*ateliers de moulinage*,” as they are called in France, where cocoons may be reeled “into grege, trams, and organzines.” These will afford a market to which small producers can bring their cocoons, and at which they can be assorted and reeled in uniform threads of different grades, and in quantities to suit manufacturers.

**COMPARATIVE PROFIT OF SLAVE AND FREE LABOR.**—A correspondent from Alachua County, Florida, states:

I formerly owned 110 slaves and made 100 bales of sea-island cotton. I had a large stock of cattle, &c. I now own 2,000 acres, one-half cleared and fenced. In 1866 I worked 86 hands and 30 mules. Am now convinced from my own experience that four plows, with high manuring and diversity of crops, will furnish a better crop and income than those derived from all my former slaves.

**CHINCH-BUGS DESTROYED.**—Mr. J. Cochrane reports from Mason County, Illinois, that in the first five days of June nine inches of rain fell, as much as in the five months preceding. It destroyed nearly all the chinch-bugs.

**GOOD SHEEP HUSBANDRY.**—Mr. R. Dibble, of Beatrice, Gage County, Nebraska, reports that he “went into winter quarters” with over 500 sheep, and lost only four during the winter. Out of 284 lambs dropped in the spring, he has, June 22d, 272 doing well. He thinks Nebraska is the best sheep country of which he has any knowledge.

**COTTON FACTORIES IN THE SOUTH.**—A South Carolina correspondent thinks that now is the time to bring the factories to the cotton. He represents that there is a great abundance of water-power in Greenville County, and advises factory men from New England, Old England, and the Northwest to come there and engage in the raising and manufacture of cotton in juxtaposition.

**FIGS IN OREGON.**—Mr. Charles C. Coe, of Hood River, Wasco County, Oregon, reports that that climate is fine for fruits of all kinds. A small

fig-tree in his garden, though liable to be killed by the cold of winter, has withstood it for two years and borne fruit.

**ALMOND TREES IN TEXAS.**—Mr. John W. Moore, of Georgetown, Williamson County, Texas, has four almond trees one year old, which appear to be as hardy as the fig-tree.

**CORK OAK.**—Mr. William H. Harris, Red River Landing, Louisiana, has a cork oak one foot in diameter, raised from an acorn obtained from the Agricultural Division of the Patent Office before the war.

**THE NATIONAL AGRICULTURAL CONGRESS.**—The Congress of the Cotton States, organized at Augusta, Georgia, in 1870, and the National Agricultural Association formed at Nashville, Tennessee, in 1871, met by previous appointment at Saint Louis, May 27, and were consolidated under the name of the National Agricultural Congress. The number of delegates present was about 400. Among the rules adopted by the new organization was one that there should be a vice-president from each State, to be nominated by its delegation when represented, otherwise appointed by the president of the congress. The principal offices were filled as follows: President, John P. Reynolds, of Illinois; secretary, Charles W. Greene, of Tennessee; treasurer, Lee R. Shryock, of Missouri. The vice-presidents chosen, as nominated by the several State delegations present, were: Alabama, C. C. Langdon; District of Columbia, John Saul; Georgia, O. H. Jones; Illinois, A. M. Garland; Indiana, F. C. Johnson; Iowa, J. M. Shaffer; Kansas, George T. Anthony; Kentucky, James H. Moore; Maryland, Henry A. Parr; Minnesota, J. H. Stevens; Mississippi, J. G. Worden; Missouri, A. B. Barret; Montana, Mr. McArdie; North Carolina, W. F. Cornica; Ohio, Norton S. Townsend; Pennsylvania, A. Boyd Hamilton; Tennessee, W. H. Jackson; Virginia, M. F. Maury; South Carolina, W. M. Lawton. The delegates, men of intelligence and high standing in the communities they respectively represented, seemed thoroughly alive to the importance of improvement in agriculture, as that branch of industry which is more general than any other, and upon the successful prosecution of which all others depend for their prosperity; enlightened and catholic views were expressed, a spirit of harmony and enthusiasm prevailed, and the deliberations generally were of a character to inspire the hope that this new organization will justify its name by the extent and efficiency of its influence in promoting the agricultural prosperity of the country.

**THE HYDE STEAM-PLOW.**—Another trial of this invention, claimed to be successful, was recently made at Obert's ranch, near Brighton, California. Since the trial last autumn changes have been made by which the working of the plow is much improved. Two steering-wheels have been substituted for one, and the driving-wheels have been widened from 15 to 30 inches. It is claimed that the machine now works well, both in tulle and in hard-clay ground, turning up the soil so as to leave it light and sponge-like; not in long, straight, but in short, spiral furrows, thoroughly pulverized. Sixteen acres were thus broken up at the recent trial.

**THE VALLEY OF THE RAPPAHANNOCK.**—Mr. John A. Parker communicates the following interesting facts and opinions respecting this valley: He has traveled much in the United States, and somewhat in foreign lands, and yet he has never seen any country so highly favored by nature as the valley of the Rappahannock. But while nature has done everything for it, man has thus far done but little. It has great facilities for living on luxuries at a cheap rate; oysters, crabs, fish, and wild

fowls are afforded in abundance by its river and its tributaries; the lands are easy to cultivate, the means of improving them are cheap, and there are rare facilities for sending their products to the great markets of New York, Philadelphia, Baltimore, Norfolk, &c. Both the soil and the climate are favorable for the production of every species of grain and roots, and all fruits, except tropical, that can be produced in any State in the Union. Lands, partly covered with fine timber, and about one-tenth, on the average, under splendid cultivation, can now be bought for from \$5 to \$20 per acre. Lastly, in healthiness of climate, the valley will compare favorably with any portion of the United States.

Mr. Parker states that taxes are lower in Virginia than in any other State, with a single exception; and thinks that if emigrants would visit that valley, and examine the extraordinary inducements it offers, they would choose to locate there rather than in some new western section, which is destitute of schools, churches, and settled society. He adds the assurance that all settlers of industrious and moral habits, from whatever section and of whatever politics, will receive a cordial "high-land welcome."

## MARKET PRICES OF FARM PRODUCTS.

Articles.	July.
NEW YORK.	
Flour, superfine State.....per barrel..	\$5 30 to \$6 00
extra State.....do.....	6 30 to 7 30
superfine western.....do.....	5 30 to 6 00
extra to choice western.....do.....	6 15 to 11 75
extra southern.....do.....	7 15 to 9 35
good to choice southern.....do.....	9 40 to 12 75
Wheat, No. 1, spring.....per bushel..	1 57 to 1 60
No. 2, spring.....do.....	1 53 to 1 55
winter, red, western.....do.....	1 63 to 1 67
amber, western.....do.....	1 70 to 1 75
white, western.....do.....	1 68 to 1 80
Rye.....do.....	82½ to —
Barley.....do.....	Nominal.
Oats.....do.....	43 to 46
Corn.....do.....	62 to 65
Hay, shipping qualities.....per ton..	23 00 to 24 00
prime.....do.....	28 00 to 32 00
Beef, plain mess.....per barrel..	8 00 to 9 50
extra mess.....do.....	10 00 to 12 00
Pork, mess.....do.....	13 00 to 13 50
prime.....do.....	10 50 to 10 75
Lard.....per pound..	8½ to 9½
Butter, western.....do.....	11 to 16
State dairy.....do.....	23 to 28
Cheese, western dairy.....do.....	7 to 11½
State factory.....do.....	7 to 12½
Cotton, ordinary to good ordinary.....do.....	20½ to 23½
low middling to good middling.....do.....	24½ to 27½
Tobacco, lugs, all grades.....do.....	8½ to 9½
common to medium leaf.....do.....	9½ to 10½
Wool, pulled.....do.....	50 to 60
tub-washed.....do.....	75 to 80
California, spring clip.....do.....	40 to 45
California, fall clip.....do.....	30 to 32
Texas, inferior to common.....do.....	30 to 43



## Market prices of farm products—Continued.

Articles.	July.	
BOSTON.		
Flour, western superfine .....	per barrel..	\$5 00 to \$5 50
western extras .....	do.....	6 25 to 8 50
western choice .....	do.....	8 50 to 11 50
southern extras .....	do.....	6 50 to 7 00
choice Baltimore .....	do.....	9 50 to 11 50
Wheat .....	per bushel..	1 55 to 1 80
Rye .....	do.....	95 to 1 00
Barley .....	do.....	75 to 1 20
Corn, southern yellow .....	do.....	68 to 69
western mixed .....	do.....	65 to 67
western yellow .....	do.....	68 to 69
Beef, mess .....	per barrel..	10 00 to 12 00
extra .....	do.....	12 00 to 13 00
Pork, prime .....	do.....	11 50 to 12 50
mess .....	do.....	14 00 to 14 50
Lard .....	per pound..	9 to 10
Butter, New York and Vermont .....	do.....	20 to 25
Canada, good to choice .....	do.....	20 to 24
western .....	do.....	15 to 22
Cheese, New York and Vermont, choice factory .....	do.....	11 to 12½
Ohio factory, good to choice .....	do.....	8 to 10½
Hay .....	per ton...	30 00 to 35 00
Wool, Ohio and Pennsylvania .....	per pound..	65 to 75
Michigan .....	do.....	62 to 70
other western .....	do.....	62 to 67
California .....	do.....	25 to 57
Texas .....	do.....	35 to 50
combing fleece .....	do.....	75 to 80
PHILADELPHIA.		
Flour, superfine .....	per barrel..	5 25 to 5 75
extra .....	do.....	6 00 to 6 75
family and fancy brands .....	do.....	7 50 to 11 00
Wheat, red, Pennsylvania and western .....	per bushel..	1 70 to 1 75
amber .....	do.....	1 77 to 1 80
Rye .....	do.....	65 to —
Corn, yellow .....	do.....	64 to —
mixed, western .....	do.....	63 to —
Oats, western white .....	do.....	43 to —
Pork, mess .....	per barrel..	14 00 to 14 50
Beef, mess, city packed .....	do.....	14 50 to 14 75
Lard .....	per pound..	9 to 9½
Cotton, middling .....	do.....	25¾ to 26½
BALTIMORE.		
Flour, superfine .....	per barrel..	6 00 to 7 00
extra .....	do.....	7 25 to 9 25
family and fancy .....	do.....	9 50 to 10 00
Wheat, choice red .....	per bushel..	2 00 to 2 10
white .....	do.....	2 00 to 2 10
Rye .....	do.....	98 to 1 05
Corn, yellow .....	do.....	67 to 68
white .....	do.....	77 to 79
Hay, western .....	per ton...	35 00 to 37 00
Pennsylvania and Maryland .....	do.....	33 00 to 37 00
Pork, mess .....	per barrel..	13 75 to —
Butter, western, prime to choice .....	per pound..	10 to 17
New York .....	do.....	— to —
Cheese, western factory .....	do.....	13 to —
eastern factory .....	do.....	— to —

## Market prices of farm products—Continued.

Articles.	July.	
BALTIMORE—Continued.		
Lard.....per pound..	\$0 8	to \$0 10 $\frac{1}{2}$
Cotton, ordinary to good ordinary.....do.....	20	to 23 $\frac{3}{4}$
low middling to middling.....do.....	24 $\frac{3}{4}$	to 25 $\frac{3}{4}$
Tobacco, common to good lugs.....per cental..	7 50	to 9 00
common to medium leaf.....do.....	9 00	to 9 50
Wool, unwashed, free from burs.....per pound..	40	to 42
tub-washed.....do.....	68	to 70
CINCINNATI.		
Flour, superfine.....per barrel..	5 50	to 6 00
extra.....do.....	7 00	to 7 25
family.....do.....	7 26	to 7 50
Wheat, No. 1, white.....per bushel..		
No. 2, white.....do.....		
No. 1, red.....do.....	1 55	to 1 60
No. 2, red.....do.....	1 50	to 1 55
Corn, white.....do.....	53	to 54
yellow.....do.....		
Oats, white.....do.....	38	to 39
No. 1, mixed.....do.....	37	to 38
Rye.....do.....	75	to 78
Barley, winter, No. 2.....do.....	60	to 75
spring, No. 2.....do.....	60	to 65
Hay, common to choice.....per ton..	16 00	to 20 00
from store.....do.....	18 00	to 23 00
Pork, mess.....per barrel..	12 00	to 14 50
prime.....do.....		
Beef, plate.....do.....	11 00	to 11 50
hams.....do.....	13 00	to 13 50
Lard, prime steam.....per pound..	8 $\frac{1}{2}$	to 8 $\frac{3}{4}$
Butter, Western Reserve.....do.....	18	to 20
choice Central Ohio.....do.....	14	to 17
Tobacco, lugs.....do.....	10	to 18
leaf.....do.....	12	to 25
Wool, tub-washed.....do.....	65	to 67
fleece-washed, manufacturing.....do.....	55	to 60
fleece-washed, combing.....do.....	65	to 70
unwashed, manufacturing.....do.....	40	to 45
unwashed, combing.....do.....	50	to 55
pulled.....do.....	55	to 60
CHICAGO.		
Flour, winter extras.....per barrel..	9 50	to 10 00
spring extras.....do.....	6 75	to 7 37 $\frac{1}{2}$
Wheat, No. 1, spring.....per bushel..	1 21 $\frac{1}{2}$	to 1 24 $\frac{1}{2}$
No. 2, spring.....do.....	1 20	to 1 23
No. 3, spring.....do.....		
Corn, No. 2.....do.....	40	to 40 $\frac{1}{2}$
rejected.....do.....	37	to 38
Oats, No. 2.....do.....	25 $\frac{1}{2}$	to 26 $\frac{1}{2}$
rejected.....do.....	22 $\frac{1}{2}$	to 23 $\frac{1}{2}$
Rye, No. 2.....do.....	56	to 58
Barley, No. 2.....do.....	52	to 56
Hay, timothy, (on track).....per ton..	13 00	to 16 00
prairie.....do.....	9 00	to 11 00
Pork, mess.....per barrel..	12 50	to 12 55
extra.....do.....		
Beef, mess.....do.....	9 00	to 9 50
Lard.....per pound..	7 $\frac{1}{2}$	to 8 $\frac{1}{2}$

## Market prices of farm produces—Continued.

Articles.	July.
CHICAGO—Continued.	
Butter, choice dairy.....per pound..	\$15 to \$0 17
fair to choice, tub and firkin.....do....	12 to 14
Cheese, New York factory.....do....	12 to 13
western factory.....do....	10 to 11
Ohio factory.....do....	10 to 11
Wool, medium fleece.....do....	59 to 62
unwashed, medium.....do....	43 to 45
tub-washed.....do....	60 to 73
SAINT LOUIS.	
Flour, superfine.....per barrel..	4 25 to 4 75
extra.....do....	5 00 to 7 50
choice.....do....	7 75 to 10 00
Wheat, red.....per bushel..	1 40 to 1 50
white.....do....	1 35 to 1 52½
spring.....do....	75 to 1 20
Corn, mixed.....do....	38 to 47
yellow.....do....	38 to 44
white.....do....	40 to 56½
Oats, white.....do....	29½ to 37
mixed.....do....	28 to 35½
Rye.....do....	58 to 62
Barley, winter.....do....	40 to 55
spring.....do....	18 00 to 21 00
Hay.....per ton..	11 80 to 12 25
Pork, mess.....per barrel..	9¾ to 8
Lard, prime steam.....per pound..	7½ to 17
kettle.....do....	7 to 11
Butter, choice.....do....	11½ to 12½
medium to fair.....do....	24½ to 25
Cheese, choice factory.....do....	7 50 to 8 50
Cotton, middling.....do....	8 25 to 9 00
Tobacco, lug.....per cental..	9 00 to 11 00
common leaf.....do....	65 to 70
medium to good leaf.....do....	54 to 62
Wool, tub-washed.....per pound..	46 to 47
fleece-washed.....do....	
unwashed, medium.....do....	
NEW ORLEANS.	
Flour, superfine.....per barrel..	6 to 6 75
extras.....do....	7 25 to 10 50
Corn, white.....per bushel..	69 to 70
yellow.....do....	57 to 58
mixed.....do....	40 to 46
Oats.....do....	28 00 to 30 00
Hay, choice.....per ton..	26 00 to 27 00
prime.....do....	12 50 to 13 15
Pork, mess.....per barrel..	11 50 to 12 00
Beef, mess, (Texas).....do....	9 to 9½
Lard, tierce.....per pound..	10 to 10½
keg.....do....	16 to 18
Butter, choice western.....do....	30 to 35
Goshen, choice.....do....	17 to 18
Cheese, New York cream.....do....	12 to 12½
Western Reserve.....do....	19½ to 23½
Cotton, ordinary to low middling.....do....	24½ to 25
middling to good middling.....do....	



## Market prices of farm products—Continued.

Articles.	July.
SAN FRANCISCO.	
Flour, superfine ..... per barrel..	\$4 50 to \$5 25
extra superfine..... do.....	5 50 to 6 25
higher grades ..... do.....	.....
Wheat, State ..... per cental..	1 75 to 1 90
Oregon ..... do.....	1 75 to 1 90
Corn, white ..... do.....	1 50 to ———
yellow ..... do.....	1 45 to ———
Hay, State..... per ton.....	8 50 to 18 50
Pork, mess..... per barrel..	17 00 to 20 00
prime ..... do.....	16 00 to ———
Beef, mess..... do.....	12 00 to 20 00
Lard..... per pound..	10 to 12½
Butter, overland..... do.....	15 to 20
California..... do.....	22½ to 25
Oregon ..... do.....	10 to 15
Cheese ..... do.....	12 to 16
Wool, native ..... do.....	30 to ———
California ..... do.....	35 to 40
Oregon..... do.....	38 to 40



